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THE GIFT OF
Fed. Board for Voc. Education



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BULLETIN NO. 16

Emergency War Training

for

RADIO MECHANICS AND RADIO OPERATORS

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FEDERAL BOARD FOR VOCATIONAL EDUCATION
WASHINGTON

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FOREWORD.

Previous bulletins of the Federal Board for Vocational Education have shown the need for mechanics and technicians in the special branches of service in the United States Army. This need is greater to-day than ever before and calls for the greatest possible effort on the part of the schools of America that have already done so much in this direction. Some months ago an appeal went out from the Federal Board for the establishment of training classes for preparing conscripted men for special Army service. As a result of that appeal hundreds of classes were started and thousands of men were trained for specialized Army service. Among these men were thousands of radio operators. Many of these men went into Army service; many of them into the Navy or the merchant marine. But the number of men trained was not nearly large enough to fill the demands of the Army, and a new call comes for thousands more.

Only a few radio operators can be obtained through the regular draft or by enlistment, for there were very few operators in the country previous to the war. It becomes necessary then to provide practically all the operators that are needed by conducting special training classes for men who will soon be called to service. The larger part of this training must come from evening classes, which will give the conscripted man an opportunity to obtain operating proficiency before he is called. To aid the schools in carrying out this work successfully this bulletin has been prepared.

The first part of the bulletin is devoted to a course in radio mechanics, or the technical side of radio work. This course was prepared at the request of the Division of Military Aeronautics, and is designed to prepare selected men so that they may enter, with advanced standing, the radio schools conducted by this division. The course aims to train the men in the fundamental principles underlying the operation of radio equipment, and thus shorten the course necessary in the day school of the Army.

The second part of the bulletin contains additional information on the training of radio operators, and is supplementary to Bulletin No. 2, which was issued some time ago. This part contains plans worked out by various schools where this training has been given, and has a valuable list of sample telegrams taken from Signal Corps practice. Both courses outlined here have been written to conform to Army standards and have been approved by Army officers.

A list of all the bulletins published by the Federal Board is given on page 75 of this bulletin; those dealing with the war emergency

training of conscripted and enlisted men being starred. Persons desiring to secure copies of these bulletins may do so by applying to the Federal Board for Vocational Education, Washington, D. C.

The courses given herein have been prepared by Russell C. Lowell, special agent for war training, Federal Board for Vocational Education, under the direction of Charles H. Winslow, assistant director for research.

The exercises given in the second part of the bulletin are the work of Dr. L. L. Thurstone, of Carnegie Institute of Technology, to whom credit is due. Acknowledgment for valuable suggestions is made to Army officers of the School for Radio Mechanics, conducted by the Division of Military Aeronautics, and to L. A. Emerson, of the Maryland State College of Agriculture.

C. A. PROSSER,
Director.

PART I.

Emergency War Training for Radio Mechanics.

SECTION I.

GENERAL PURPOSE.

This course is prepared for use in evening schools in which properly qualified men are to be given preliminary training which will fit them to enter with advanced standing the schools maintained by the Division of Military Aeronautics of the United States Army. There is no attempt made to give specific instruction in special Army apparatus, but rather to give a thorough ground work in the general principles and theory underlying the operation of radio apparatus, and such skill in its construction and repair as may be possible.

METHOD OF PREPARATION.

The preparation of this course was begun at the request of the office of the training section, radio branch, of the Division of Military Aeronautics. The course to be given in the schools of this division was submitted to the Federal Board for Vocational Education, with the request that it be studied with a view to modification or simplification for use in preparatory classes in evening schools. Certain modifications were suggested and embodied in a second suggested course. This second course was submitted to the authorities at the above office, and also to the officers of instruction at the School for Radio Mechanics at Carnegie Institute of Technology. A representative of the Federal Board visited this school and discussed the course as given there and the proposed course in detail. The present course is the result of these conferences and of subsequent conferences with the chief of the above division.

QUALIFICATIONS OF INSTRUCTORS.

The instructor for the school and laboratory work in this course should have a rather wide experience in teaching, should be well versed in the fundamental theory of electricity and magnetism, and should be able to impart his knowledge in such a way that it will be of definite practical use. His experience may well have been obtained in a technical high or vocational school, or an engineering college. Actual experience in radio construction is desirable, but is not absolutely essential. It is not necessary that the instructors

be experienced radio operators, though some skill in this work is to be desired. While the advanced part of the course requires some specific knowledge of radio work, this information can be obtained by the instructor during the time he is conducting the first part of the course. The teacher of physics in a high school should be able to do this work acceptably.

The shop instructor should be a man of teaching experience, a good machinist and toolmaker, a man who can devise exercises which will tend to produce general manipulative skill on the part of his students, and who is either familiar with wireless apparatus or is willing and able to get this knowledge. He should be able to give some instruction in blue-print reading. In most cases the regular shop instructor should be able to qualify in this respect.

QUALIFICATIONS OF STUDENTS.

The qualifications of students should be considered from two points of view:

(a) Those best fitted to profit by the instruction.

(b) Those eligible for admission to classes which are to receive Smith-Hughes aid.

In order to obtain the best results preference should be given to men from certain trades, a number of which appear in the following list:

Telephone trouble hunter.
Switchboard repairman.
Electrician.
Bell hanger.
Armature winder.
Telephone inspector.
General electrician.

Auto ignition expert.
Wireless amateur.
Watchmaker.
Instrument repairman.
Jewelryman.
Locksmith, etc.

It is felt that these men will have considerable hand skill and some theoretical knowledge upon which to base the work of the course; men between the ages of 18 and 31, whose physical condition is good, are to be preferred, since the Signal Corps finds it inadvisable in general to enlist men over 31 and prefers men in good physical condition. Men above 31 may be admitted if there is sufficient room in the class. If the class is crowded, it would be well to discourage the attendance of men who do not intend to use the training for military or naval service. Men eligible for limited service only should so state at the time of entrance; the fact should also be entered on their registration blanks.

The rulings of the Federal Board have made it possible to admit to classes receiving Federal aid any men liable for military service. Classes which do not receive reimbursement from the Smith-Hughes

fund may, if it seems wise to the local authorities, be open to other classes of men and to women. The Smith-Hughes agents may supervise these classes, and the use of the board's certificates will be allowed if the work is up to the board's standard. It is suggested, however, that even in these classes those unfit for military service be excluded unless their presence does not overcrowd the class.

EQUIPMENT.

A good laboratory equipment is essential. Demonstration apparatus should be available for work in magnetism and direct and alternating currents, and for studying the relation of current to voltage in multiple and series circuits. Many examples of primary and storage cells, together with special apparatus for studying inductance and capacity should be provided. There should be sufficient individual apparatus to enable the students to investigate for themselves the fundamental principles of electricity and magnetism, together with the effect of inductance and capacity in circuits.

In high schools where the subject of physics is emphasized there will usually be found most of the necessary equipment. Some of the additional apparatus that is necessary may be made in the shop; other special pieces may usually be purchased by the school or through the kindness of some public-spirited citizen, or be obtained by loan from the local electric company or some electrical contractor. Suitable rooms for the use of this equipment will be found in any public high school.

The shop equipment necessary will usually be found in a technical or vocational high school. Speed lathes, small screw-cutting lathes, a tool grinder, bench drills, bench room with machinists' vise, drill presses, files, small drills, taps and dies, hack saws, metal shears, and the usual hand tools, should be available. Supplementing these, there should be simple carpenter's tools, and, if possible, a foot-power lathe.

Since the classes are to be small (not more than 15) an extensive equipment is not necessary.

The radio equipment should be very simple. At the start the buzzer and key shown in Fig. 1 #1 is all that is necessary. Later there should be a head receiver for each member of the class and sufficient keys for sending practice (at least one for each six students). The connections may well be those of Fig. 1 #3. At least one table equipped in a similar manner should always be available for practice during spare time after the formal work has been completed.

The other connections shown in Figs. 1 and 2 are also possible, as well as the one shown in Appendix E, page 68. Many other "hook-ups" may be devised by advanced workers.

CHARACTER OF INSTRUCTION.

The course has three phases:

1. Work in the theory of electricity and magnetism necessary for a proper understanding of the principles of wireless telegraphy and telephony;

2. Work in the shop designed to develop skill in the handling of tools and the making of repairs on wireless apparatus, and to give some idea of the kind of repair work necessary at the front;

3. A brief course in radio operation, intended to develop sufficient skill in sending and receiving to enable the men to test apparatus that has been set up. It is not intended that sufficient skill in the operation of wireless sets shall be acquired to qualify a man as a radio operator.

DURATION OF COURSE.

In order to acquire the general principles and the theory underlying the operation of radio apparatus and to gain sufficient skill in its construction and repair to enter with advanced standing in the Army schools, it is estimated that the average student will need to attend the class for 150 hours. If the school work is supplemented by a reasonable amount of outside study (it is recommended that two evenings per week should be given to outside preparation), men with sufficient previous training may be able to do considerable advanced work.

All men should be urged to remain in attendance at least 100 hours; those whose draft call is deferred sufficiently should remain 200 hours or more, continuing the work through its advanced stages.

Regular attendance is very essential and should be urged upon all students. Those whose attendance is irregular should, unless there is decided reason to the contrary, be replaced by those who can attend regularly.

The time of the school should be divided about equally between shopwork and theory in most cases. If this division is to be varied, the time spent in the shop should be shortened rather than that in the laboratory.

Radio operation should occupy from 20 to 30 minutes per night for the first part of the course. When the students have attained a speed of eight words this work may be discontinued as a regular assignment, though apparatus for practice should be available throughout the course.

SIZE OF CLASSES.

In order to secure the best results, the classes should be small, with not more than 30 as a maximum. The class should be conducted in two groups, one of which should be in the shop for half the period, while the other is in the laboratory and classroom;

the groups meeting together for radio operation during a short middle period of from 20 to 30 minutes, and then changing places. This method is rather better than the one in which alternate meetings are given to shop and to classroom, respectively.

METHOD OF INSTRUCTION.

Instruction in all three phases should be individual so far as possible after the first 10 hours. In the class there should be occasional talks, profusely illustrated by experiments. The students should assist in all possible ways in the demonstration and there should be no attempt at the formal "lecture" at any time. Laboratory work should take up more than half of the time allotted to the theory. Individual work should be the rule so far as possible, the students working in pairs or in groups only when such a procedure is necessary from the nature of the experiment or when sufficient apparatus is not available. It is expected that in the more advanced experiments, group work will be necessary.

It is the opinion of officers in charge of the instruction in the Army schools, and of most teachers of engineering and science, that laboratory work is much more effective if careful notes are kept. It is, therefore, advised that each student be provided with a notebook, preferably of such size that it will slip into the side pocket of the Army coat, and that he be instructed in the method of keeping notes in such a way that the results obtained may be available at any time in the future. This notebook should be inspected from time to time. No student should be given credit for completing a unit until the notebook for that unit is in fair condition.

Before being assigned to the regular shop work each man should be tested to determine his degree of skill. This may be done by giving him a task of the kind which he says he can do, with no instructions as to its method, and then observing his procedure. The work assigned thereafter may then be given with definite regard to the skill of the individual. Instruction should be entirely individual in this phase of the work, each man going as far and as fast as possible. The upper limit of work here may be much in advance of the material laid down in the detailed outline of the course. Each student should receive instruction in certain essential features, notably, small work on the lathe and drill press; filing of irregular forms; drilling brass, copper, and steel with a breast drill; tapping small holes; filing; soldering; and, if possible, some practice in brazing. The necessity for constructing bases for apparatus will require also a little work in simple carpentry.

The shop work should be so conducted that at the end of the course each man should have produced at least one-half of the usual amateur wireless set, except the telephone receiver.

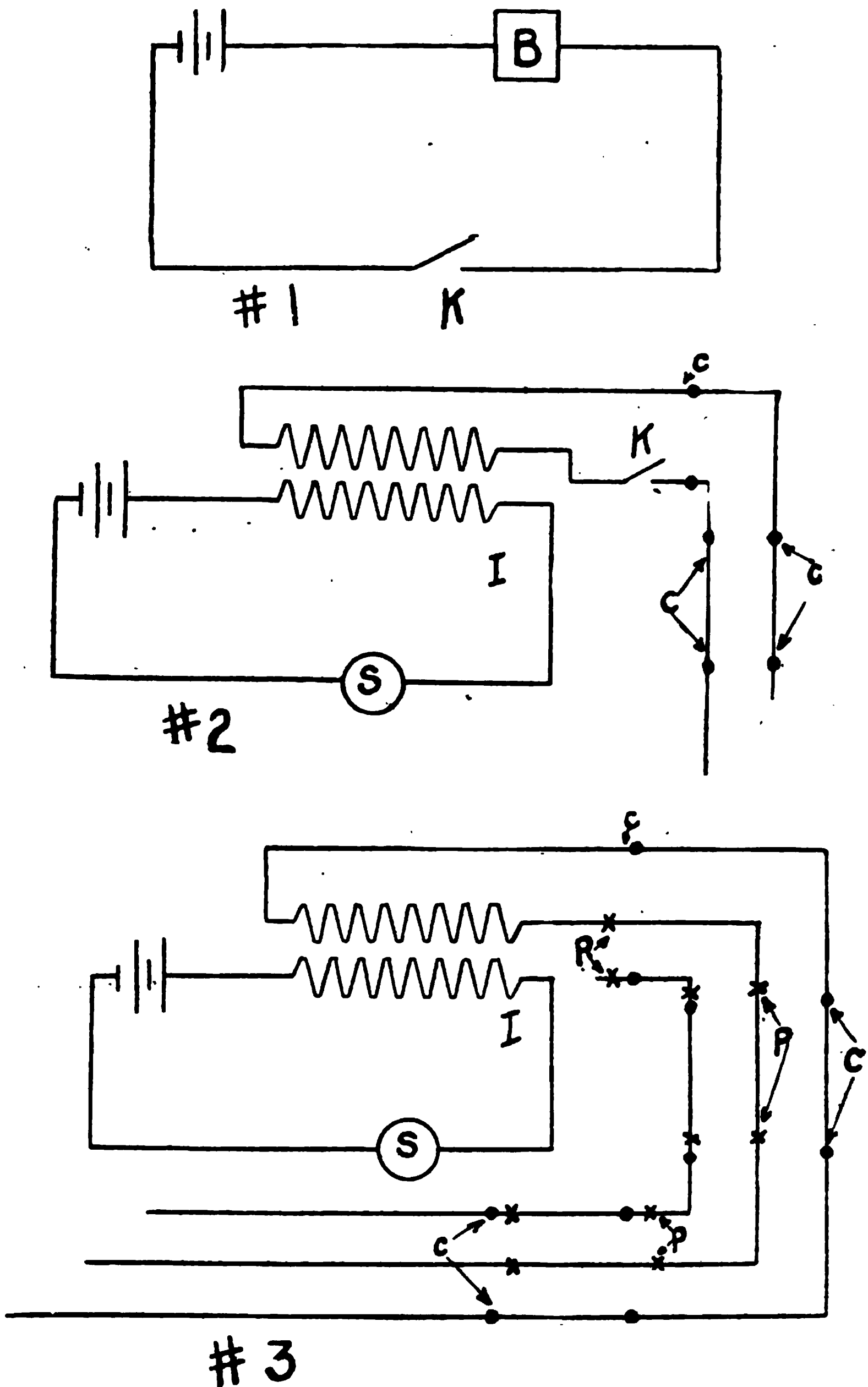


FIG. 1.—Connections for radio-buzzer operators. B, Buzzer; C, spring clips; K, sending key; P, binding post; I, induction coil; S, switch.

The radio operation should be conducted as a distinct phase of the work only at the beginning of the course. Until the men have attained a speed of from five to eight words per minute, a period of from 20 to 30 minutes per night should be given to it. When the above proficiency has been attained the student need do no further work of this kind as a regular part of the class activity, but apparatus should be available so that he may practice during such time as he can get from other work.

It is suggested that the radio operation may well be given during the middle of the school session; that is, between the hour devoted

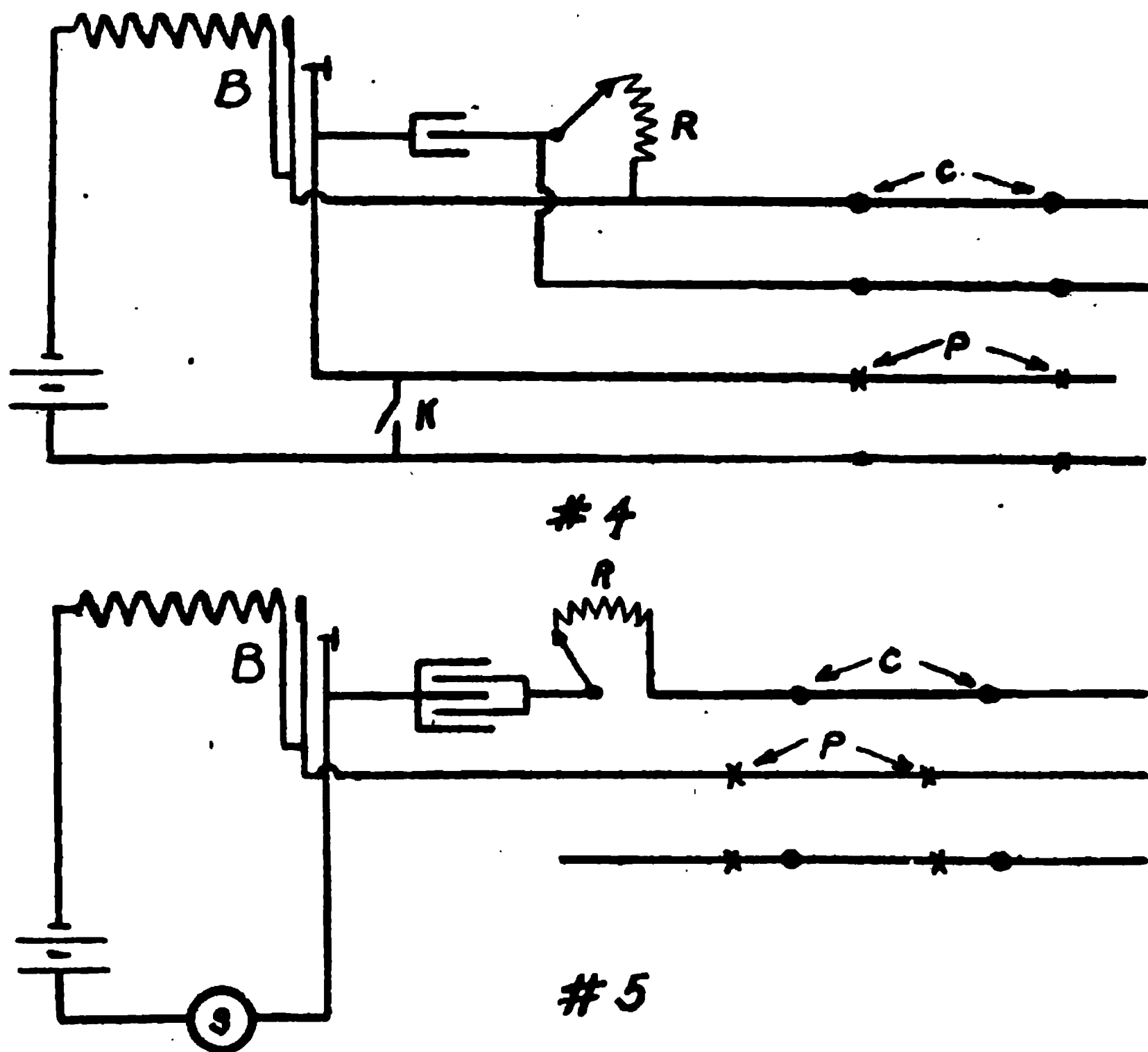


FIG. 2.—Connections for radio-buzzer operation. B, Buzzer; C, spring clips; K, sending key; P, binding posts; R, resistance; S, switch.

to theory and that devoted to shop work. This will furnish a change in the kind of work and will prove restful to the student. When the class is familiar with the alphabet, facilities for sending practice should be provided.

Diagrams of suitable connections for drill in receiving are given in Fig. 1 and Fig. 2, also in Appendix E, page 68. It should be remembered that the problem of "hooking-up" instruments is one that may confront even a radio operator. Each person should therefore be urged to draw diagrams of the common hook-ups and to devise special connections to fit certain emergencies. These given in Figs. 1 and 2 are merely suggestive.

OUTSIDE PREPARATION.

It is expected that students in this course will devote at least one evening a week (more would be desirable) to a careful study of the theory of wireless. This should not be perfunctory reading of texts but a very careful study, since radio mechanics must know thoroughly the theory and the details of construction of the apparatus upon which they work. Schools for radio mechanics under the Army's supervision definitely provide for two hours of study three nights a week. It can not be too strongly emphasized that, in the opinion of the Army instructors, a thorough knowledge of theory is absolutely essential for successful work and that this theoretical knowledge can not be obtained without careful study.

UNIT COURSES.

For convenience in grading pupils, the work done is divided into units. School units and shop units are independent, but the theory and laboratory work are considered together. Each school unit embraces work in a definite subject, or in closely related subjects. The nature of the work in theory as a whole is such that these units should in general be taken in the order of their numbers. The shop units may be taken in whatever order is necessary, though it is advised that the order given in the detailed course be followed whenever possible.

ADVANCED WORK.

Since the men taking this course will probably vary in previous preparation, as well as in ability, it has been thought wise to include in the course outlined, suggestions for work of a more advanced character than would be given to all students. This work consists of the very definite construction of radio apparatus from drawings furnished by the Signal Corps, or by manufacturers of commercial apparatus, or obtained from other sources. The possibilities of this work are considerable, and it is felt that no man should ever be forced to leave the class because he has completed all the course.

The advanced work in theory will be somewhat harder to handle, but the use of suitable texts will suggest to the instructor much more theoretical information than is included in the course as outlined.

In the appendices will be found some suggestions for advanced work, some fundamental formulas, and a bibliography.

UNIT R-1.

Classroom.

The nature of electricity and magnetism.

The relation between electricity and magnetism.

Primary batteries; types and theory.

The flow of current in a simple circuit. Simple definitions for the ampere, ohm, and volt.

Measuring instruments:

D'Arsonval type,
Dynamometer type,
Hot wire type.

Laboratory.

Magnetic field about a bar magnet, U-magnet, a wire carrying current, a solenoid.

Experiment to show direction of electric current.

Factors affecting strength of magnetic field.

Examination of dry cells and other primary batteries. Discharge curve from primary cells.

Elementary experiments in connecting up bell, buzzer, and similar circuits.

Examination of voltmeter and ammeter; diagrams of connections. Study of the hot-wire ammeter. Illustrations of instrument defects.

UNIT R-2.

Classroom.

Ohm's Law and its applications.
Series and parallel circuits.

Cell connections; series, parallel, and series-parallel.

Laboratory.

Investigate Ohm's Law.

Check computations for series and parallel circuits.

Test effect of grouping cells by allowing current to flow through a constant resistance.

UNIT R-3.

Classroom.

Theory of the storage battery.

Study of commercial lead batteries. Willard, Exide, etc.

Examination of new plates, worn plates, damaged plates, etc.

Lead battery troubles.

Edison battery; construction and operation.

General care of storage batteries.

Laboratory.

Simple battery from strips of sheet lead in sulphuric acid. Charge, discharge, reverse, etc.

Charge and discharge commercial lead batteries.

Locate and repair cases of trouble in lead batteries.

Tests of charge and discharge with Edison battery.

UNIT R-4.

Classroom.

Electromagnetic induction.

Spark coils.

Study of simple A. C. circuits.

The transformer.

Laboratory.

Investigation of electromagnetic induction by various qualitative experiments.

Spark-coil tests.

Tests of A. C. circuits with and without choke coils, etc.

Voltage measurements on primary and secondary of transformer.

UNIT R-5.

Classroom.

Direct-current machines.

Theory and operation of generator and motor.

Shunt, series, and compound windings.
Care and maintenance.

Laboratory.

Laboratory tests of both motors and generators, including wiring connections, starting and field rheostats, changing of speed and voltage, etc., on machines with a rating of one-half horsepower or above.

The tracing of connections and the drawing of proper diagrams of connections is essential. Practice should be given until the class has real skill in this work.

UNIT R-6.

Classroom.

Ohm's law and its application to A. C. circuits.

Inductance; cause and effects.

Condensers; effect and use.

Laboratory.

Investigate the relation of I, E, and R in A. C. circuits.

1. No inductance or capacity.
2. Inductance.
3. Capacity.
4. Inductance and capacity.

Note effect of iron core on inductance.

UNIT R-7.

Classroom.

Theory of the ether wave.

The production and detection of waves used in wireless telegraphy.

Oscillating circuits.

Tuning of circuits.

(It is desirable at this point that the instructor should conduct general laboratory work rather than giving much individual laboratory instruction.)

Laboratory.

Experiments with simple detectors.

Experiment in tuning, if possible.

Diagrams of simple wireless connections.

UNIT R-8.

Classroom.

Theory of rectifiers and detectors.

Types of aerials.

(This work will contain some theory which can not well be illustrated by apparatus. There should be, however, plentiful demonstration and experiment.)

Laboratory.

Test several detectors and rectifiers.

Connect these with oscillating circuits.

Investigate the effect of increased inductance and capacity.

Make careful diagrams of the connections used in all cases.

Advanced work.

UNIT R-9.

Detailed study of the effects of close and loose coupling.

This should be laboratory work almost entirely. This will only be taken up by the more advanced students.

UNIT R-10.

Classroom.

Study of commercial wireless sets.

Laboratory.

The work here should be all laboratory investigation, diagrams being made and sufficient explanation given in the notebooks so that the student will really have his own set of directions for field use.

UNIT R-11.

Study of the Signal Corps sets. This is only possible in exceptional cases where these sets can be supplied.

Shop work.

UNIT RS-1.

This follows the preliminary test of the skill of the individual. Make a working sketch of a telegraph key either from a key or from a blue print. Form the arm, base, and key under the direction of the instructor. Make wooden base and mount key upon it. See sketch. Make detector holder for crystal detector.

Note.—The key should be of such design as to require practice in drilling, threading, and tapping, as well as work with a file and the carpenter's tools.

UNIT RS-2.

Make a sketch of a spiral inductance. Construct the inductance from sheet brass or copper. Care should be taken to arrange supports for this spiral on the base in such a way that its position will be fairly permanent. This should be mounted on the same base with the key.

UNIT RS-3.

Practice simple coil winding. Construct a coiled inductance, a loose coupler, a simple induction coil, sounder, or buzzer.

UNIT RS-4.

Make a working sketch of a fixed condenser, or a variable condenser; construct condenser according to the sketch.

UNIT RS-5.

Make a drawing of a complete receiving set using crystal detector. Construct the various parts of the set, including necessary cords, tips and binding posts.

Advanced work.

UNIT RS-6.

Construct simple sending set in accordance with drawings previously made.

Note.—It would be perfectly proper to substitute repair work on voltmeter or ammeter belonging to the school for any one of the units above mentioned. The material constructed should require work on lathe and drill press for at least six hours.

SECTION II.

The following pages contain special suggestions for actually carrying out the laboratory and shop work of the course. A set of general directions in regard to laboratory procedure, certain formulæ whose use should be familiar to the students, and questions intended to indicate the extent of the knowledge of theory which should be possessed by those who complete the course are also included.

It should be remembered that the laboratory experiments and questions are intended to be helpful both by furnishing actual material for use and by suggesting the kind of material that is to be used.

Special attention should be directed to the making of diagrams and sketches. The illustrations in this bulletin indicate the kind of sketching which the students should be able to do and the kind of apparatus that should be made in the shop.

In the appendices will be found certain information which is thus made more readily available than it would be in textbooks.

LABORATORY WORK.

This part of the work furnishes what is, in the opinion of the Army officials, the best opportunity for giving real knowledge of the basic phenomena in radio work. The instructor should be extremely careful to keep up the interest of the class. It is very easy to over-emphasize the notebook, and yet a carefully kept notebook is essential. It is also very easy to have laboratory work become merely "watching the wheels go round." This should be avoided and any student showing insufficient interest in the laboratory work should be promptly informed that such an attitude will subject him to expulsion without certificate.

Too much emphasis can not be given to the suggestion that this work should be individual and thorough. No man can really become an expert radio mechanic without a thorough understanding of the principles which can be illustrated in the laboratory; in many instances with simple apparatus. It will be noted that in only one instance it is suggested that the instructor perform experiments himself. This exception is due to the fact that work with detectors and oscillating circuits is likely to be unsuccessful when attempted by beginners. It is therefore suggested that in Unit R-7 the laboratory work be practically of demonstration type; the students, of course, assisting as far as possible. It will be necessary for the instructor to carefully prepare these experiments in advance, however, since the bad effect of an experiment which does not work at this point is far reaching.

SHOP WORK.

The instructor in machine shop will probably find it necessary to prepare blue prints of certain standard parts of wireless sets which can later be assembled into complete working units. Should sketches

of Signal Corps sets not be available suitable ones can be made from simpler sets for amateurs sold by some of the firms making wireless apparatus, some of which are listed in the appendix to this bulletin.

It is very desirable that the men be taught to use a treadle or foot power lathe of small size in order that they may be somewhat familiar with the actual conditions they will meet in the Army. Very little practice is needed on large engine lathes or drill presses, since the work of these men will be entirely on radio work, which is really a phase of instrument repair.

Students should be required to make neat working drawings or sketches of the pieces they are to construct before beginning actual work. This will avoid many mistakes and will give needed practice in sketching.

GENERAL INSTRUCTIONS FOR LABORATORY WORK.

The following directions are given for the convenience of the instructor. It is suggested that they be duplicated and a copy given to each member of the class. They should certainly be read in substance to the class.

1. In order to receive full benefit from laboratory work, proper preparation should be made by the student. He should think over the directions and, if possible, study the subject to be investigated.

2. Unless a careful record of work done in the laboratory is kept, a large part of the value of the work is lost. Therefore, keep an accurate and neat notebook.

3. Arrange the notes in a regular order. It is suggested that *purpose, apparatus, diagrams, readings, computations, conclusions*, may be used as headings.

4. Write this notebook up at the time of the experiment so far as possible. Never trust to your memory for results.

5. When in the laboratory, work promptly and, whenever possible, without depending upon others.

6. When in a laboratory or near machine work, treat every wire as alive and every machine as dangerous. Never open or close switches or circuits not connected with your own work, except in case of serious emergency.

7. Never touch anything in a laboratory which is being used by another person and which is not required in your experiment.

8. CAUTION: Students will be held responsible for the proper care of apparatus. Damage caused by failure to follow directions must be repaired by the person responsible. Always insert safety devices in a circuit from any source of power large enough to cause damage to apparatus.

9. Tangled wires should never be used in making connections. Arrange circuits as simply as possible.

10. Do not break a circuit by pulling the wire out of a connection: always have a switch in the circuit.

11. Handle all electrical measuring instruments with great care. Many of them are delicate and costly. Always use these instruments in the position for which they were built; do not expect a voltmeter designed for horizontal work to function well in a vertical position.

12. In using A. C. instruments on D. C. always take reversed readings; take the average as the true reading.

13. Be especially particular when connecting an ammeter in a circuit; *always connect it in series with other apparatus*. The voltmeter should be connected in multiple.

14. In making connections always start at the dead end and work toward the power. This avoids dangerous shocks in high-tension work.

15. Report promptly all accidents or damage to instruments. This will enable material to be repaired with the least possible delay.

SUGGESTED LABORATORY EXPERIMENTS.

(Make drawings to illustrate each experiment if possible.)

Unit R-1—Laboratory.

ELECTRICITY AND MAGNETISM.

1. Show the effect of like and unlike poles upon each other, suspending one magnet. (Map field of force with iron filings.)

2. Show that copper and glass do not stop magnetic lines.

3. Show by means of compass or iron filings that a magnetic field exists around a wire carrying a current. Determine the right-hand rule for direction of current.

4. Make solenoid; send current through it and determine its polarity.

5. Determine the rule for winding a coil to produce a north pole at a definite end.

6. Show that increased ampere-turns per inch increase the strength of a magnet. (In what ways may ampere-turns be increased?)

PRIMARY BATTERIES.

7. Take short-circuit voltage and amperage of dry cell.

8. Get discharge curve for dry cells. To do this, connect the cell with voltmeter and ammeter properly in circuit through sufficient resistance to give a current of about 400 milliamperes. Read voltmeter and ammeter every 3 minutes for half an hour. Multiply V and I. Use the products as ordinates for the curve.

9. Open the circuit and take a voltage reading every 5 minutes for half an hour.

MEASURING INSTRUMENTS.

Examine carefully a dissected D'Arsonval type galvanometer. Note carefully the modifications to make it into a voltmeter or ammeter. Simple experiments should be performed, using any convenient resistance and source of electricity. Data obtained can readily be used in computations. Test the instrument on alternating current. Examine an A. C. instrument of similar type. Examine a hot wire ammeter. Note the time element required for its use. (Why not hot wire voltmeter?)

Unit R-2—Lab.

INVESTIGATION OF OHM'S LAW.

By means of the instruments noted above and the use of known resistances, test Ohm's Law by taking readings on simple circuits, and checking the results by calculations from the law.

Take instrument readings on simple series and parallel circuits, checking the rules for current flow in series, parallel, and series-parallel circuits.

CELL CONNECTIONS.

Make tests of various ways of connecting cells in groups to determine the proper method of connection under given conditions.

Unit R-3—Lab.

STORAGE BATTERIES.

1. Cut an old lead storage battery to pieces, examining its parts carefully.

Examine parts of an Edison battery.

2. Make lead battery by putting two lead plates in sulphuric acid of proper strength, charging for 10 minutes with 2 amperes, and discharging and charging again. Note voltage at the end of each charging. Note color of the two plates, which is negative and which positive.

3. Make small resistance coil and discharge cell through it. Note recuperation of cell.

4. Reverse the charging current. Open the circuit and take voltage. Examine plates after this reversal.

5. If lead storage cells are available, several advance experiments should be made.

Careful instruction should be given in the methods of handling the two kinds of storage cells, special emphasis being placed on their differences. Special emphasis should also be given to the use of the hydrometer; the effects of impure electrolyte; effect of standing without use, both charged and discharged, filled and empty. Each student should receive thorough instruction in this subject, since mainte-

nance of the cells in proper condition in the field is vital to Signal Corps work.

Unit R-4—Lab.

ELECTROMAGNETIC INDUCTION.

Connect a large coil with removable iron core to a sensitive galvanometer. Insert and remove bar magnet. Insert and remove coil carrying current. Connect galvanometer to a separately excited generator and turn this by hand. In all these note the galvanometer action carefully. If a large electromagnet is available, the effect of induction may well be shown by connecting it in series with some incandescent lamps and suddenly placing an iron yoke across the pole of the magnet.

SPARK COILS.

Simple tests should be made on spark coils which bring out the operating characteristics. A coil such as is used in the Ford automobile is suitable for this purpose. Note the care required to keep the contact points in shape. Note also the connections and the use of the condenser, and the method of construction; also the insulation of the secondary circuit.

A. C. CIRCUITS.

The tests made at this time should be qualitative, bringing out the difference between the action in a D. C. and an A. C. circuit.

TRANSFORMERS.

Connect a transformer of suitable size and voltage ratio to a source of alternating current. (Great care must be exercised in handling transformers, as wrong connections may produce a voltage which is dangerous to life.) Take readings of the current and the voltage of the primary and the secondary circuits. Change the load on the transformer and repeat the readings. State the law for transformers from information obtained in this manner. The matter of transformer losses and efficiency should be explained.

Unit R-5—Lab.

DIRECT-CURRENT MACHINES.

The preliminary experiments on these machines should be simply to give an idea of the methods of making connections and starting and stopping machines. Diagrams of connections should be made before attempting to connect any real apparatus. This experiment should be made on motors of less than a quarter H. P. without starting accessories. The difference between series and shunt machines should be briefly pointed out. Compound machines need not be considered.

CONNECTIONS AND RUNNING OF D. C. MOTORS AND GENERATORS.

Practice should be given in connecting and running motors or generators of reasonable size from a quarter H. P. up, using all the common accessories. Connections should be carefully traced before the current is turned on; the reasons for the various protective devices and accessories should be clearly explained. It would be well to start a shunt motor with open field, *using proper precautions*. This work is designed to familiarize the student with actual running of machines of the small size with which the Signal Corps is equipped. A small A. C. generator is very desirable here; A. C. motors are not to be considered at this time.

TESTS, REGULATIONS, AND CARE OF MOTORS AND GENERATORS.

It is felt by the officers of instruction of the Army schools for radio mechanics that taking characteristic currents of machines is extremely desirable. It is suggested that the external characteristic of the three common types of generators be taken. If this is not possible for an individual exercise, it should be done by the class as a whole.

Investigation of the methods of speed control of D. C. motors should be made.

Cautions against over-speeding and the reasons for them should be emphasized.

The common defects, such as short-circuited coil, open armature coil, broken field, dry bearings, and dirty commutator, should be illustrated.

Unit R-6—Lab.

ALTERNATING CURRENT CIRCUITS.

Using a large coil with removal iron core measure the resistance D. C.; then A. C., both with and without an iron core. Note the differences. (Note: A. C. instruments should be used for both currents in this experiment.) Note capacity in the circuit. Measure resistance with both A. C. and D. C. current. Insert capacity and inductance in the circuit and make the same measurements. (Note: It is desirable to have inductance and capacity which will balance each other as well as some which do not.) Note the reactive effect upon breaking a circuit which contains inductance, or capacity, or both.

Unit R-7—Lab.

ELEMENTARY RADIO APPARATUS.

The laboratory work of this unit may well be a study of the kind of equipment usually used by the amateur wireless operator. This will include crystal detectors, other common types of detectors, loose couplers, and other equipment used in the receiving set. It may be possible to test detectors and the principles of tuning by using a small spark coil without aerial.

*Unit R-8—Lab.***RECTIFIERS AND DETECTORS.**

This study of detectors should be more advanced than that of the previous unit. Various types of oscillating circuits may be set up to explain the effect of inductance and capacity.

As stated above, a small induction coil without aerial will furnish sufficient ether waves to operate most crystal detectors. Connections should be made so as to form a simple oscillating circuit giving damped waves (see diagram) and the class should practice adjusting the detectors so as to receive the oscillations. Care should be taken to so arrange the simple circuits that tuning will not be necessary at the start.

The effect of inductance and capacity on the circuit should be studied until the class has a reasonably good idea of the process of tuning. The ingenuity of the instructor will enable him to devise apparatus which can be used for this.

MERCURY ARC RECTIFIER.

In order to give an idea of the use of the vacuum tube detectors (Fleming valve, audion, etc.) it is suggested that a study be made of the mercury arc rectifier if possible. This study will serve two purposes:

1. It will give some idea of the theory of the vacuum detectors (Fleming valve, audion, etc.) and
2. It will also teach the student how to use the rectifier for charging storage batteries.

Two experiments are suggested:

1. To determine the ratio of the D. C. to the A. C. voltage for various voltages.

Connect the A. C. voltmeter across the terminals of the bulb and the D. C. across the D. C. terminals. Vary the A. C. voltages so as to get at least 5 readings and note the corresponding D. C. voltage. A bank of lamps may be used for the load when the voltage is lower than the rating of the lamps. Compute the watts input and output.

2. Connect the rectifier so as to charge a storage battery. Note carefully the method of operation and indicate special precautions to be observed. Indicate the advantages and disadvantages of the rectifier for this work in the Signal Corps.

*Unit R-9—Lab.***EFFECT OF COUPLING.**

This can probably be taken up, if at all, only by a few advanced students. Sets may have previously been constructed in the shop which will allow the study to be made.

ADVANCED WORK.

Should any of the members of the class show sufficient ability, advanced experiments in real radio work can be devised after consulting the text books which will be found listed in the bibliography. It is difficult to find simple experiments which are suitable.

It is suggested that the manufacture of a wave meter should be one of the tasks assigned very early in the class to one or two students of notable ability. This instrument is easily constructed and in most cities there are technical laboratories at which the instrument may be standardized.

SUGGESTIVE QUESTIONS.

The following list of questions is given to show something of the kind of information with which the student should be furnished. It will be noted that very little numerical work is indicated. The student should, however, be able to handle such formulas as—

$$I = \frac{E}{R} \text{ and } W = EI.$$

He should also be able to compute frequency and wave length for wireless waves. This really involves no knowledge of mathematics beyond arithmetic. (See Appendix H.)

These questions are not intended to be exhaustive, but simply to furnish suggestions to the instructor. Some of the questions are what might be called catch queries, but it is found that questions of this nature are occasionally of value. Two or three tests or quizzes which have been actually given in one of the Signal Corps schools for radio mechanics are also appended. It is suggested that before a student is given a certificate for any definite unit he be required to pass a short and comprehensive test on the theory.

ELECTRICITY AND MAGNETISM.

What are some theories in regard to the nature of electricity?

Are there any relations between electricity and magnetism?

What is the real test of a magnet?

How can it be shown that electricity and magnetism are related?

How can the magnetic effect of a solenoid be increased?

What effect has an electric current on a compass needle; tell exactly what would happen under the circumstances you mention?

Is there such a thing as a single magnetic pole?

Give a rule for determining the direction of a current by means of a magnetic needle.

State clearly the things that effect the strength of a magnetic field around a conductor carrying a current.

BATTERIES.

- What is a primary cell; a secondary cell?
- What chemical action takes place in each kind? (General statement only; no chemical formulas.)
- Of what is the black powder in a dry cell composed?
- What is the use of the carbon rod?
- What is the use of the paper just inside the zinc?
- What things may cause the cell to lose its power?
- Why is an absolutely "dry" cell impossible?
- What is the objection to wet cells for field work; for laboratory work?
- Where may wet cells well be used?
- What is meant by polarization; its cause; its removal?
- Name the two types of lead cells.
- What is the voltage of a normal lead cell?
- What is the proper strength of electrolyte for lead cells?
- What precaution should be used in mixing electrolyte containing sulphuric acid?
- Are pure chemicals necessary for this electrolyte?
- What are the advantages of the two types of lead plates?
- What difference does the size of the plate have on the battery?
- Which type is most commonly used in the Signal Corps?
- What does a white deposit on the plates indicate? Does this deposit always indicate a defective cell?
- How can you tell the positive plate in a storage cell?
- What is the difference between the terms "battery" and "cell"?
- Describe the Edison cell; mention some of its advantages.
- What is the electrolyte? What is its open-circuit voltage?
- What will be the effect of overcharging a lead cell; an Edison cell?
- What is the effect of short-circuiting each type?
- When should the electrolyte be changed in each type?
- Why are storage cells desirable for Signal Corps work?
- What are the disadvantages for this service?

MEASURING INSTRUMENTS AND CIRCUITS.

- What is a "D'Arsonval type" instrument?
- Why is this type very convenient?
- Why can it not be used for A. C. current?
- How may it be modified so as to work with this current?
- What is a magnetic core type?
- Mention its advantages and disadvantages.
- What is a hot-wire ammeter frequently used for?
- What is the difference between a galvanometer and a voltmeter; between a galvanometer and an ammeter?
- How should a voltmeter be put in a circuit?
- What would happen if an ammeter were put in the same way?
- What would happen if a voltmeter were placed in the circuit in the way an ammeter should be placed there?
- What precaution should be observed in using measuring instruments? (In order to protect the instrument; in order to protect the circuit.)
- What types of instruments are used for A. C. measurements?
- What are the disadvantages of the dynamometer type?

Give a diagram of six cells connected in series; in parallel, in series-parallel (2 ways).

If the voltage of each cell is 2 volts, what are the voltages of the combinations in the preceding question?

Tell what current the combinations of cells mentioned above would send through 2 ohms.

What is the rule for connecting cells for greatest efficiency?

What is Ohm's law?

When does it apply?

What is meant by circuits in shunt; in series?

What is the rule for the resistance of circuits in multiple?

Give the formula for finding the total resistance of a shunt of 2 branches; of 3 branches; of 4 branches.

What is the effect of adding circuits of the same resistance in multiple? Mention at least one instance in practice where this is done.

What is meant by a watt?

Give the formula for computing the watts in a circuit.

NOTE.—All students of electricity should be able to compute W. I. E. and R. The 12 variations of these combined formulas should be in the possession of each man. Considerable practice in their use should be given.

ELECTROMAGNETIC INDUCTION AND ELECTRICAL MACHINES.

How is an electric current produced in a dynamo?

What is meant by electromagnetic induction?

Why does it receive that name?

Is energy produced by electromagnetic induction?

Why is it called "induction"?

In what ways may the voltage produced by electromagnetic induction be increased?

What is the rule for the direction of an induced current? (It is not necessary that the "finger" rules be memorized. A statement of reversal of the direction of motion or direction of lines of force is sufficient.)

What machines use the principle of electromagnetic induction in their operation?

Is it necessary to have a loop of wire to obtain induced currents?

What are the parts of a direct-current machine?

Mention several types of armature cores.

Name several types of field magnets.

What is a "magneto"? Where is it still used?

Why is it not used for large generators?

What is the purpose of the commutator?

Name 3 types of motors according to method of electrical connection.

Why are extra devices needed in running larger machines?

CONDENSERS AND INDUCTANCES.

What is a condenser?

What is "self-induction"?

How may it be increased?

Under what circumstances is there absolutely no self-induction in a circuit?

Mention some common objects which have little self-induction.

How may a noninductive coil be wound?
 When is inductance useful?
 What is the effect of inductance on apparent resistance?
 What is the effect of a condenser on a direct current?
 Does an alternating current really pass through a condenser?
 What do we call a circuit closed except for the condenser?
 What effect does a condenser have upon the lag or lead of a current?
 What effect does inductance have on the speed of current and voltage movement?
 What is the effect of putting condensers in parallel; in series?
 What is the effect of putting inductances in parallel and in series?
 What is the effect of combining inductance and capacity in series?
 When is this done?
 Name some well-known apparatus containing a condenser.
 Name some apparatus in which self-inductance is useful.
 Is self-inductance present in the field coils of a generator?
 Explain the principle of the common spark coil.

CONNECTIONS OF MACHINES.

Why is a shunt dynamo given its name?
 What circuits are in shunt?
 Are armature coils of a D. C. machine usually in shunt or series?
 Which is the simpler connection, shunt or series?
 Which is the more common?
 What is a compound machine?
 What is the difference in the field winding of a series and shunt machine?
 How do the armatures differ?
 Give a diagram of the connections of the shunt motor without accessories.
 Do the same for series and compound machines.
 Which motor will run at the highest speed? Which is the most common? Which will act as a generator if driven by external power?

CARE AND CONTROL OF MACHINES.

What is the effect of increasing the field strength of a shunt generator?
 Why does it take power to turn the armature in a magnetic field?
 If the external circuit is open on a shunt machine, what becomes of the current generated? What becomes of the current generated when a series generator has its external circuit open?
 How does the current flow under the same circumstances in a compound machine?
 What is meant by the external characteristics?
 Give a diagram of connections for taking external characteristics of a series machine; of a shunt machine; of a compound machine.
 What other characteristics might be taken?
 What is the use of a characteristic curve?
 Are "curves" ever used except in electrical work?
 Where is a rheostat placed in a shunt generator? Where in a shunt motor?
 What is the effect of reversing the field connections in a shunt motor; in a series motor?

What is the advantage of a compound motor; of a compound generator?

How can the speed of a shunt machine be varied?

What is the effect of opening a field on a shunt motor; on a shunt generator?

For what is a series generator used; a series motor?

How do the various parts of the different types of machines differ?

What is the advantage of a large number of segments on the commutator?

What may cause continuous flashing in the commutator? What is usually the cause of a single flash once in each revolution?

How can a short-circuited coil in a generator be first detected; in a motor?

What is the effect of an open field circuit in a shunt generator; in a shunt motor?

How can the difference between an open circuit and a loose connection be found?

What is the effect of dirt on the commutator?

What damage will be done to a machine which "races"?

Under what general type of machine does an alternating generator belong? How is the field usually excited?

Why is it not excited from the collector rings of the machine?

For what are A. C. motors used?

Why do we not study them more in detail in this course?

Why should we study the A. C. generator at all?

Can an alternating current be produced by any modification of a D. C. generator?

VOLTAGE CHANGES.

How may the voltage of a direct current be changed.

Why can we not use a transformer?

Explain how a transformer works.

Give the laws of a transformer.

How many secondary turns would be needed in a transformer to step up from 10 to 50 volts if the primary contained 20 turns?

How would the current in the secondary compare with the current in the primary?

Where do losses occur in transformers? How efficient can transformers be made?

What precautions must be taken in working with transformers?

What two types of transformers are common?

What are the advantages of each?

What is the difference between a transformer and an induction coil?

Which is usually best for wireless work?

What is the difference between a "step up" and a "step down" transformer?

ETHER WAVES.

What is ether?

Why are you sure it exists?

What natural phenomena are believed to be due to ether waves?

What is the difference between X-ray waves, wireless waves, light waves, and heat waves?

What is the formula for wave length?

Does this formula apply only to wireless waves?

What is the formula for wave lengths in sound?

How is it different from the one for wireless waves?

In what material is there no ether?

Describe some experiments which show that wireless energy travels in waves in ether.

What devices are used in wireless circuits to vary the wave length?

What is the effect of each one?

(NOTE.—This subject should not be discussed in great detail, but the class should be given a fairly good idea of modern notions of ether waves, particularly as applied to wireless.)

DETECTORS AND AERIALS.

Name several types of detectors.

Which kinds are used in the Signal Corps?

What is the advantage of the crystal detector over the "tikker," if any?

What is the disadvantage of the electrolytic rectifier or detector?

Why is the crystal detector convenient? What are some of its disadvantages?

How is it connected in the circuit?

What is meant by a Fleming "valve detector"?

Why is it not used more widely?

Explain briefly how a crystal detector works.

Which is the most sensitive detector? Why is it not used more commonly?

Explain the theory of its operation.

Give a diagram of it connected to a circuit.

What is meant by a oscillating circuit?

What are damped oscillations?

What are their advantages in radio work?

How may undamped oscillations be produced?

What is the type produced by the simpler wireless sets?

What is meant by an aerial?

Why does it have this name?

Mention several types of aerials.

Show how aerials are sometimes connected to the earth.

Why should aerials be insulated?

What is meant by a "directional" aerial?

Explain briefly the theory of the directional aerial.

What is the common type of aerial?

How may a substitute for the "ground" in a system be produced?

Explain its theory.

Explain the theory of tuning.

What is the effect of extra capacity in the aerial?

What is meant by resonating circuits?

What is the effect of inductance on the aerial?

If your aerial is low what would be needed to send long waves?

When is wireless sent most readily?

What are some of the things which interfere with radio operation?

Why is there such interference?

Is it possible to do away with interference? Why?

Name some common types of inductance.

Mention the advantages and disadvantages of each.

What spark gaps are in common use?

Why is a rotating gap not used in field sets?

Why is arc transmission not common in field sets?

What are the proper connections for sending out damped oscillations?

How would the diagram be changed for undamped oscillations?

What kind of transformers are used in transmission sets?

COUPLING.

What is meant by coupling?

How may coupling be made less close; how more close?

In what way is a wave meter connected with a circuit to be tested?

What is a wave meter in principle?

How may the coupling be increased? What is the disadvantage of close coupling? Why is variable coupling necessary?

What is the standard wave length for naval work?

What is the frequency of the standard radio note?

Why should it not be higher?

Does the size of the receiver have any effect on the sensitiveness of the receiving set?

Is it possible to injure the detector by your own sending current?

TESTS. OR WRITTEN QUIZZES.

The following sample tests are taken from actual practice at an Army school. They give an indication of the kind of work that should be expected from students in a class for radio operators. These questions relating to S. C. R. sets are, of course, peculiar to schools under Army supervision; those relating to vacuum tubes are suitable for advanced classes only; most of the others might well appear in the weekly test in any class in this subject.

A.

1. Define volt, ampere, and ohm.

2. Define a watt. How would you find the watts in a direct-current circuit?

3. What is the unit of inductance? What is the unit of capacity?

4. If we have a wire in which the current is flowing from the south to the north and we place a compass above this wire, which direction will the north pole of the needle point?

5. Give rule for finding the direction of lines of force around a current-carrying wire.

6. Why is the resistance of a coil of wire greater with A. C. than with D. C.?

7. We have three resistances of 8, 10, and 20 ohms in series. What is the equivalent resistance?

8. What is the equivalent resistance of the above resistances in parallel?

9. With the above resistances in parallel and 10 amperes flowing through the 8-ohm resistance, what is the current in the other two?

10. Describe the construction of a condenser.

B.

1. Define volt, ohm, ampere, watt, mutual induction.
2. How many amperes will a 150-watt lamp draw on a 120-volt circuit?
3. If 2 coils, 10 ohms, and 30 ohms are connected in series on a 130-volt circuit, what will be the current in amperes flowing in each? What will be voltage drop across each? Connect in parallel and answer same questions.
4. Define capacity, condenser, inductance.
5. What is the difference between the effects obtained when a piece of iron and a piece of steel are placed in a magnetic field?
6. What is meant by equivalent resistance?
7. Find equivalent resistance of a 10 ohm, 20 ohm, 30 ohm, 40 ohm, and a 35 ohm coil, connected in series and parallel.
8. What is Ohm's Law?
9. What is meant by open-circuit voltage? Closed-circuit voltage?
10. What is meant by a noninductive resistance? How would you wind one?

C.

1. Given 10, 15, and 25 ohms resistance, what is the equivalent resistance when the three are connected in series? In parallel?
2. Define volt, ohm, and ampere.
3. (a) State Ohm's Law.
(b) What is the unit of capacity? Of inductance?
4. Describe methods of measuring resistance by the drop of potential method, using Ohm's Law. Show diagram and instruments, also indicate readings required.
5. Draw schematic diagrams of shunt, series, and compound generators. Also show characteristic curves of each.
6. Given 40-4 volt 100 ampere hour capacity batteries.
Given 30-8 volt 60 ampere hour capacity batteries,
Given 20-10 volt 40 ampere hour capacity batteries.
Draw diagram of connections for charging from 110-volt circuit; also indicate current in each branch and in the line.
7. What is the effect of putting condensers in series? In parallel?
8. What is the effect of varying the field current of a shunt motor? Explain fully.
9. What is the effect of putting inductance and capacity in series?
10. What effect has D. C. on inductance? A. C. on inductance? Explain.

D.

1. (a) Define a dynamo.
(b) Define a motor.
2. (a) Name the three types of dynamos.
(b) Draw sketch of each.
3. Draw characteristic curve of each type of dynamo.
4. (a) Explain how to vary the voltage of a shunt dynamo.
(b) Speed of a shunt dynamo.
5. Name five precautions to observe in charging storage batteries.
6. (a) What is the voltage of a lead storage battery when charged and discharged?
(b) What should be the specific gravity in both cases?

7. Will the voltmeter and ammeter reverse from charge to discharge? Why?

8. Using 75 words, give description of No. 763 dry battery.

9. Give outline of experiment of dry battery test given under R1.

10. Show by diagram the connecting of the following storage batteries. Also give the current in each branch, total charging current, and cost of charging batteries at 10 cents per kilowatt hour. Voltage of charging circuit, 110 volts.

20-4 volt 100 ampere hour batteries.

20-10 volt 80 ampere hour batteries.

10-20 volt 60 ampere hour batteries.

Assume a proper charging voltage.

E.

1. Draw a schematic diagram of the circuits of a spark coil. Show how it may give a high alternating e. m. f. when operated on a low potential battery.

2. What precautions would you observe when connecting up storage batteries for charging?

3. If you have 20-10 volt, 80 ampere hour batteries,

If you have 6-4 volt, 100 ampere hour batteries,

If you have 16-18 volt, 2 ampere hour batteries,

show by means of a diagram how you would connect them to 120 volt supply bus bars for charging.

4. Show how you would connect S. C. R. 65 and S. C. R. 54 sets so that they may be used with the same antenna.

5. What steps would you go through in tuning the S. C. R. 54 to receive signals from a station sending at a wave length of 300 meters?

6. How would you adjust the S. C. R. 65 set to send at a wave length of 300 meters?

7. What is a dynamotor and what is its purpose in the Signal Corps?

8. A transformer has 100 turns of wire on the primary winding and 1,000 turns on the secondary. If the load on the secondary is adjusted so that where 110 volts of alternating e. m. f. is applied to the primary, 10 amperes flow in the primary circuit, what are the secondary e. m. f. and current?

9. What is an autotransformer?

10. How long and at what ampere rate could you discharge an 80 ampere hour storage battery? How long and at what ampere rate would you charge it to bring it back to its previous condition?

F.

1. Do electrons flow from plate to filament, or vice versa? Does the current flow from plate to filament, or vice versa? Give reasons for both answers.

2. Show laboratory connections for determining variation of plate current with grid potential.

3. Show by a diagram the shape of the grid potential—plate current curve. Indicate by an x the point on the curve for best detector action. Also point for best amplifier action.

4. Show by a diagram the shape of the filament current—plate current curve.

5. What is space charge effect?

6. Show a diagram of connections for using the vacuum tube as a detector.

7. Show a diagram of connections for using the vacuum tube as a generator of undamped oscillations.

8. Show external connections for using the S. C. R. 54 and 55 together. Where do you use the dummy brass plug? Why?

G.

1. Why will not the S. C. R. 54 receive a sustained wave signal, such as is sent out by the S. C. R. 69?

2. Draw a sketch of the panel board of an S. C. R. 70 showing all binding posts, adjusting knobs, and switches.

3. What voltage is required on the plate circuit of a V. T. 1 tube and why? Of a V. T. 2 tube? Give a list of all S. C. R. instruments using V. T. 1 tubes and state numbers of tubes used in each instrument. Do the same for V. T. 2 tubes.

4. How many vacuum tubes are in the S. C. R. 68 and what is the purpose of each?

5. Explain how a vacuum tube may act as a detector.

6. Explain how a vacuum tube may act as an oscillator.

7. Explain how a vacuum tube may act as an amplifier.

8. You are charging a lead storage battery, the specific gravity has reached 1,220, and on continuing the charge the specific gravity does not rise. What do you do?

PART II.

A course of training for radio operators.

SECTION I.

PURPOSE.

This course has been prepared as a handbook for the use of teachers of this subject. It is not intended to be used primarily by radio experts, though it is felt that the methods and material will be useful wherever students wish to master the art of sending and receiving (translating) messages transmitted by wireless telegraphy.

The practice material has been taken from a more extensive list selected and arranged by Dr. L. L. Thurstone, of the Carnegie Institute of Technology, for the use of classes in that institution.

QUALIFICATIONS OF TEACHERS.

Instructors for this work should preferably be expert telegraphers or persons who hold a first-grade radio license. Since the learner from the start should be made familiar with correct sending, he should hear no radio signals sent by unskilled amateurs until he is able to receive with fair speed. If it is impossible to secure qualified instructors, some really skilled amateur may start a class while himself acquiring sufficient knowledge of the technique of the subject to later obtain a commercial license of first grade. Women with proper qualifications should be able to conduct these classes successfully.

QUALIFICATIONS OF MEN.

Classes under the supervision of the Federal Board must be free (though a returnable registration fee may be charged) and, if Smith-Hughes aid is to be given, under public supervision and control. The salary of the instructor must in this case be paid from funds entirely under public control. Any man over 18 who can profit by the instruction may be admitted to these classes, though if a man is over draft age he should not displace one subject to military service. Communities may also admit to these classes any other person for whom this training is supplemental to their day employment.

Classes may be supervised by the Federal Board for Vocational Education through State boards, even though Smith-Hughes aid is not desired. To such classes anyone may be admitted whom the

local authorities permit, but Federal Board certificates will not be issued unless the instruction is in accordance with the Federal Board standards.

METHODS.

The work should be taken up in a very definite way if the best results are to be secured. From the very beginning the student should be made familiar with the sound of the signals used in commercial work. He should from the first night hear the letters sent individually at correct speed; that is, with the dots, dashes, and spaces of the correct length. This means that a dot and a space between separate sounds in a letter should occupy the same interval of time. A dash should take as much time as three dots, the space between the letters in a word the time of three dots, and the space between words the same time as five dots.¹ In order to get a correct idea of this, a skilled operator should do the sending, or the work may be conducted in such a way that phonograph records of radio work, which are available, can be used.

During the first lessons the letters and characters should be explained and illustrated on the blackboard before being sent. In this way, the correct visual idea of the comparative lengths may be given and the alphabet learned more readily. Cards containing the code should be in the hands of each student from the first night so that he may learn the alphabet by home study. Each student during the receiving work should write each letter as it is sent. The written work may then be handed in for correction if the instructor keeps a record of what he sends during the evening. The lessons given in this bulletin furnish material for such sending. An exercise may be sent several times in succession, then reversed in order to prevent the men from memorizing it. By alternation of these exercises considerable variety of work may be obtained. The actual sending of work should at the start occupy about 2 minutes, then a brief interval should elapse before another exercise is sent. At the close of each session a progressive speed test should be given. This is given by sending slowly at first so that everyone can get every letter, then increasing the speed until at the close of the exercise only about one-half the class can receive what is sent. This plan is found to increase the speed of receiving very materially.

It has been found that best results are obtained if the work of the class consists of periods of from 15 to 25 minutes, during which the closest attention is required; these periods should be followed by periods of 5 minutes or more of complete relaxation. This procedure is less fatiguing for students and instructor and the results are much better than from attempted intensive work for long periods.

¹ See Robison's Manual, page 219.

After the class has been in operation a short time, it will be well to form several groups in accordance with the skill of the men. In this way each student will be able to advance as rapidly as his ability warrants.

No theoretical work is included in this course, since the purpose is simply to teach men to send and receive messages in the shortest possible time. Where speed is not essential, the theoretical work given in the course for radiomechanics may be used. More advanced theory could be profitably given only to those who have considerable maturity and scientific training. It is also very difficult to give advanced work without real sets of apparatus. The present laws, however, prevent the erection of aerials except under Government supervision. (See Appendix G, p. 70.)

EQUIPMENT.

For the first 7 lessons, or until alphabet, punctuation marks, and figures are learned, a single key and a high-pitched buzzer will be all that is necessary for a group of 20 to 30. Later each student should have a head receiver so as to get used to receiving messages in this manner. When sending practice begins—at the end of about 15 hours—keys should be available in the ratio of 1 to 6 students at least. If these are legless and connected as in Fig. 1, #3 (p. 12), it will be easy to arrange for each one in the group to send in his turn.

The connections given in the diagrams are suggestive only. Many others may be used. Fig. 1, #1, shows the simple arrangement to send the buzzer note by means of a single key. If two ordinary telegraph keys are placed in series, two people can practice sending alternately. Keys might also be connected in multiple, but for this work such a connection is not desirable. Fig. 1, #2, shows a method of wiring a room or table so that the sound of the buzzer itself is not heard. The key opens and closes the secondary of the buzzer or induction coil circuit. Head phones of low resistance (40 to 80 ohms) may be fastened to snap connectors, soldered to the wires at each place as indicated. It is possible to put a buzzer in series with the primary of a telephone induction coil taking the current for the head phones from the secondary circuit.

The snap connectors indicated on the diagram should preferably be the tooth-spring connectors (Fahnestock) that are obtainable at supply stores. The ordinary cord tip may then be snapped under these connectors, and when it is necessary to discontinue work it is easily released. Binding posts may be used, but they are less desirable than the snap connectors. Fig. 1, #3, is a modification of Fig. 1, #2, showing how a legless key may be inserted at each desk and the signals sent from it. It is suggested that spring tips be used for the attachment of the head phones and that binding posts be used for

the attachment of the key. This will prevent improper connections and will take advantage of the fact that the snaps will release the cords easily, thereby preventing damage to the cord tips if a sudden strain is brought on the connecting wires.

It is possible to adjust a telegraph sounder on a 110-volt A. C. 60-cycle circuit in series with a lamp and key in such a way that it will produce the necessary wireless tone. A "howler" telephone set may be used to produce the wireless note also.

Advanced instruction will simply consist of sending code and straight matter at the highest speed possible for the group. This will obviously be impossible unless the instructor has considerable skill.

Code or cipher work should not be taken up at the early part of the course, but may be brought into the work when the class has a speed of 10 words. This work is the real test of the ability of the student and is a most necessary part of the work in war practice.

The students should be ranked in words per minute, a word being considered as five letters. It is suggested that tests for rank be given at least once a week and the students regrouped in accordance with the results of these tests. Best results will be obtained if each student works at his full capacity at all times.

SECTION II.

The exercises and lessons in this part are taken from material prepared by Professor Thurstone, of Carnegie Institute of Technology.

The instructor is urged to send each letter at full speed. Regulate the speed of sending by lengthening the time interval *between* the letters and words; never between the parts of a letter. Each letter should be given its normal rapid sound with short clear dots and with the time interval between dots and dashes equal in length to the dots. The time interval between letters should, of course, be greater at the start than when speed is attained.

The exercises may be repeated as many times as seems wise. It is well, however, not to send the same exercise for too long a period, since the class will memorize the characters. This may be prevented by sending first forward, then backward, or by alternating two or three in consecutive exercises.

In code practice send the exercise (about 20 symbols), then ask one of the students to read what has been sent. It also adds to the interest to send a series of symbols two or three times, then in the midst of the third sending stop and ask a member of the class what is the next symbol to come. It is also well to adopt actual code practice by repeating symbols; thus, if *cxyna* is the code word, it may be sent *cc—xx—yy—nn—aa* or *cxyna—cxyna*.

Continental or International Morse Telegraphic Code.

(See Robison, p. 219, for additional symbols.)

A	• —	1	• — — — —
B	— • • •	2	• • — — —
C	— • — •	3	• • • — —
D	— • •	4	• • • • —
E	•	5	• • • • •
F	• • — •	6	— • • • •
G	— — •	7	— — • • •
H	• • • •	8	— — — • •
I	• •	9	— — — — •
J	• — — —	0	— — — — —
K	— • —	Period	• • • • •
L	• — • •	Comma	• — • — • —
M	— —	Question	• • — — • •
N	— •	Exclamation	— — • • — —
O	— — —	Colon	— — — • • •
P	• — — •	Semicolon	— • — • — •
Q	— — • —	Dash	— • • • —
R	• — •	Hyphen	— • • • • —
S	• • •	Quotation	• — • • — •
T	—	Apostrophe	• — — — — •
U	• • —	Fraction line	— • • — •
V	• • • —	Parenthesis	— • — — • —
W	• — —	Underline	• • — — • —
X	— • • —	¹ Double dash	— • • • —
Y	— • — —	Distress call	• • • — — — • • •
Z	— — • •	Attention	— • — • —
		Error	• • • • • • •

¹ Used as "break" to separate preamble from address, address from text, text from signature, etc.

ELEMENTARY LESSONS.

LESSON I.

Exercise 1.—Explain T, M, O, on the blackboard and on the buzzer.
M O M T M O T M T O T T M O O T O O M M T M M O M T O O T T

Exercise 2.—Explain E, I, S, H, on blackboard and buzzer.
E I H E H E E H I S S I S S H S I S I I S E I H H I E E H E

Exercise 3.—Explain T, M, O, E, I, S, H, on blackboard and buzzer.
E O I E T M O T I M M T S H H O S S H M I E E T H I T M O S

Exercise 4.—Explain A, U, V, on blackboard and buzzer.
A U V A V U A A V U A U U A V U A V U U V A A V U V U V A V

Exercise 5.—Explain N, D, B, on blackboard and buzzer.
N D D B D N D B N N D B B N B D B N N B D B N B D D N B D N

Exercise 6.—Explain A, U, V, N, D, B, on blackboard and buzzer.
A N U V U N A D B V D B V N A B U D V D A B N U N V B A U D

LESSON II.

Exercise 7.—Review:
S O M T I H T E E I M H S S O H H S T M M I T O M T E I O E

Exercise 8.—Review:
D U A B V N U N B A D V D U B A N V B D V B D A N U V U N A

Exercise 9.—Explain R, L, F, on blackboard and buzzer.
F R F L R F L L R F L R L F L R L F R F R R F L L F R F R L

Exercise 10.—Explain K, C, X, on blackboard and buzzer.
K X C K K X C X K X C X X K X C K X C K X K C X X K K C C

Exercise 11.—Explain R, L, F, K, C, X, on blackboard and buzzer.
R X F K L C R X F L C R F C L K R C F X R C K F L X K C L K

Exercise 12.—Review:
E O I E T M O T I M M T S H H O S S H M I E E T H I T M O S

LESSON III.

Exercise 13.—Review:
D U A B V N U N B A D V D U B A N V B D A N B A N U V U N A

Exercise 14.—Review:
K L C K X L F K C T X F C K R L X F C R L F C R C L K F X R

Exercise 15.—Explain W, P, G, Z, on blackboard and buzzer.
P W Z G P W P Z G W Z P G W Z P G W Z P G P W Z W P Z G W P

Exercise 16.—Explain J, Q, Y, on blackboard and buzzer.
J Q Y Q J Y Q Y J J Q Y J Q Y J Y Q Y J Y Q J Q Y J Q J Y Q

Exercise 17.—Explain W, P, G, Z, J, Q, Y, on blackboard and buzzer.
G W P W J Z Q W G Y J P Z Q G P J W W Y Z G Q P J P Y W Y Z

Exercise 18.—Review:
E O I E T M O T I M M T S H H O S S H I E E T H I T M O S T

LESSON IV.

Exercise 19.—Review:

A N U V U N A D B V D B V N A B U D V D A B U D V D A B N U

Exercise 20.—Review:

R X F K L C R X F L C R F X L K R C F X R C K F L X K C L K

Exercise 21.—Review:

G W P W J Z Q W G Y J P Z Q G P J W U Z G Q P J P Y W Y Z Q

Exercise 22.—Review:

H R B Q G Y A P U F S Z O C E T J N R C W N K U D Y F V L M

Exercise 23.—Explain 1, 2, 3, 4, 5, on blackboard and buzzer.

3 2 5 1 5 4 3 5 2 1 5 3 4 5 3 1 2 1 3 4 1 4 2 3 1 4 5 2 4 2

Exercise 24.—Explain 6, 7, 8, 9, zero, on blackboard and buzzer.

8 0 7 9 6 0 7 0 8 6 7 9 0 7 6 8 0 9 6 0 8 6 7 9 0 8 9 6 7 8

LESSON V.

Exercise 24.—Explain 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, on blackboard and buzzer.

1 0 9 4 2 8 3 7 5 2 6 8 4 3 9 1 6 0 7 5.05 2 8 3 6 1 4 9 7

Exercise 26.—Review:

M L V D T S U K N W C R N J T E C O Z S F I P A Y G Q B R H

Exercise 27.—Review:

7 9 4 1 6 3 8 2 5 0 5 7 0 6 1 9 3 4 8 6 2 5 7 3 8 2 4 9 1 0

Exercise 28.—Review:

1 A G 9 E W 8 B H 2 7 F L C P 3 M Y 6 D R N 4 S O O 5 T K W

Exercise 29.—Explain , ; : on blackboard and buzzer.

: ; , ; : ; : ; , ; : ; : ; , ; : ; : ; , ; : ; ,

Exercise 30.—Explain . ? - " on blackboard and buzzer.

" . - " ? ? . - " . ? - " . ? - ? " - ? . " ? " . " - . ?

LESSON VI.

Exercise 31.—Explain / ' (on blackboard and buzzer.

/ ' (/ ' ((/ ' ' / ((/ ' (' (/ ' (' (/ ' ' (/ ' /

Exercise 32.—Explain . ? - " , ; : / ' (on blackboard and buzzer.

, " - ; ? : / , ' (? - , (' ; / " (- : ; (. / : ? . ? ,

Exercise 33.—Review:

M L V D T S U K N E C R N J T W X O Z S F I P A Y G Q N R H

Exercise 34.—Review:

7 9 4 1 6 3 8 2 5 0 5 7 0 6 1 9 3 4 8 6 2 5 7 3 8 2 4 9 1 0

Exercise 35.—Review:

K T 5 O O S 4 N R D 6 Y M 3 P C L F 7 2 H B 8 W E 9 G A 1 Z

Exercise 36.—Review:

, ? - . " ; : , . / - . : " ' (; / : . (- , " / ? (' ; '

LESSON VII.

Exercise 37.—Review:

A ' 1 S ? 5 K . " 2 1 9 6 C Q 4 U 8 M : Y 3 G 7 , C) W A

Exercise 38.—Review:

T 9 8 ; J 2 R B 7 1 D , L 6 Z 6 Z N 3 H O - V (P 4 X / F ,

Exercise 39.—Review:

7 . 1 O ? 2 6 - 9 2 9 " 8 8 1 5 , 3 ; 3 7 0 : 4 / 4 6 ' 5 (

Exercise 40.—Work for speed in recognizing the following short words:

be an go me no up in or is it or go me an in be is no it up
be me go in me or no is up it or it is in up no me go am be

Exercise 41.—Work for speed in recognizing the following words:

by he my so if an on as at of if so he by as on my an of at
he at by of as an my so on if of at as on an if so my he by

Exercise 42.—Work for speed in recognizing the following words:

be go by he me my no so up if am an in or or as is at it of
go he my so if an on as at of be by me no up am in or is it

CODE PRACTICE TABLE.

This table is given for convenience in code sending. The lines of characters may be read up or down or from right to left or diagonally. By using the numbers at the top of the columns and at the right side the instructor may indicate what has been read without the necessity of writing the characters separately, thus:

"6d" means the sixth column was read down.

"3r" means the third column was read to the right.

"1vdr" means the reading began at the top of the first vertical column and was read diagonally to the right.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	
C	2	F	,	K	:	O	9	W	D	.	G	1	X	U	;	Q	()	M	8	A	3	J	"	(1)
L	7	S	!	P	6	E	/	H	?	Y	R	4	V	'	T	O	-	N	Z	I	5	B	K	(2)
9	Q	5	Y	3	A	x	J	.	F	6	B	V	?	L	Z	'	F	4	E	:	R	O	M	(3)
2	O	9	D	;	I	()	S	,	1	C	8	U	'	N	!	G	T	7	?	/	K	H	A	(4)
:	F	Y	E	.	3	K	B	O	H	Z	U	!	C	5	P	T	A	W	4	N	?	H	I	(5)
/	G	3	L	C	X	!	M	Q	"	T	-	R	2	V	P	B	Z	U	!	S	9	A	W	(6)
9	C	H	:	P	2	X	B	8	V	.	F	-	O	!	A	6	Q	1	"	I	N	5	J	(7)
D	'	L	3	R	,	T	Z	E	()	K	;	W	4	G	/	S	O	U	?	M	7	Y	B	(8)
6	Q	:	F	5	A	.	W	Y	-	G	7	P	!	B	4	O	/	H	;	N	'	R	X	(9)
E	6	I	"	M	1	S	X	J	,	L	8	D	?	T	9	U	()	G	7	O	-	?	F	(10)

WORD LISTS FOR ADVANCED LESSONS.

The following word lists are to be used for the receiving tests. The average length of word in each list is five letters.

LIST NO. 1.

daily
fact
change
strange
chase
choice
bath
web

rag
wrangle
explain
brief
base
camp
danger
flatter

dispute
crime
case
dainty
saddle
aim
lamb
shadow

pebble
crackle
dam
nor
help
claim
teacher
lathe

watt
mad
can
stagger
dairy
tax
spire
bridge

LIST NO. 2.

advance
praise
rainy
rank
pin
cap
stem
plain

strait
breathe
inch
range
plaster
join
hat
hammer

dim
crimp
happen
finally
daisy
hid
board
surf

saunter
rip
post
eclipse
rob
manger
voice
afraid

benefit
bit
mill
chief
thrash
naughty
pity
scrape

LIST NO. 3.

faith
stamp
hurt
rod
wharves
stable
rode
handy

Tom
furnace
patient
drape
not
waif
gather
sailor

crape
darling
hop
crab
tub
waist
church
shouted

gasp
globe
cut
alarmed
staple
dust
wood
adjourn

banner
cable
tar
servant
gate
age
caught
table

LIST NO. 4.

maple
stream
war
wiggle
fail
warmer
barn
trigger

par
scalp
aunt
man
taught
bathe
concise
starve

bee
daunt
distant
warm
dance
flaunt
path
awe

observe
yarn
warmth
briskly
egg
pause
eraser
ward

her
twelfth
scarf
garret
wit
daub
measure
gaunt

LIST NO. 5.

had
worthy
legions
trade
wide
limb
oak
feeble

sport
realize
prefer
mad
arch
achieve
exist
shape

extend
satisfy
but
cone
ride
circle
its
vital

quickly
powers
explain
know
state
rim
divine
raid

peg
serious
board
total
bold
execute
regret
mop

LIST NO. 6.

author
jet
initial
toll
evoke
usher
dismiss
import

day
cow
mercy
enemies
just
vision
valor
certain

rude
normal
ant
waged
yoke
mob
approve
answer

hither
fortune
next
gag
chant
benefit
hear
rumor

eel
moment
case
proof
examine
rap
allies
city

LIST NO. 7.

Brazil
wash
compete
net
ought
how
vehicle
emblem

full
blaze
hurt
colony
fun
comfort
honor
thought

dot
found
face
confer
quick
pew
solemn
element

read
task
lie
steak
struck
neutral
shade
key

protect
find
denial
unity
jam
literal
impair
twin

LIST NO. 8.

bet
active
slow
furnace
camps
oracle
rage
whistle

ham
direct
rifle
fair
ivy
instant
chair
ear

verdict
next
adjust
lapse
laurel
fact
hog
event

charity
fur
organ
return
type
deposit
collide
state

bib
mine
exceed
regret
channel
pace
ail
amaze

LIST NO. 9.

bravely
crib
teeth
verbal
add
eagle
stripe
run

step
while
edition
stretch
ate
tint
script
wrench

year
use
print
elected
joy
thrash
finally
strip

sigh
theft
shield
edifice
act
silk
car
emotion

smile
prince
dish
mild
foe
wrist
approve
steady

LIST NO. 10.

flesh
vicious
dupe
cap
crotch
shroud
tribe
element

oath
bet
puzzle
rinse
duke
prevail
ten
proved

quilt
sprout
wise
cap
pier
flaring
perch
prompt

wit
bench
sincere
film
dip
loaves
chiefly
aim

size
splint
cloud
mead
fierce
raining
owe
crept

LIST NO. 11.

soap
verge
thrust
capital
for
plum
average
crisp

why
throat
are
things
supreme
wall
rebel
spy

yonder
sweat
mule
respond
spike
advance
beyond
fit

drug
overall
yield
coarse
hat
foam
subject
burn

niece
per
pocket
mug
plunge
purpose
spur
prize

LIST NO. 12.

filth
secure
granted
arc
goal
third
salary
get

slow
suppose
floss
prop
need
art
whereby
special

office
caw
full
birth
free
mount
inquiry
tackle

box
birch
method
excused
nine
act
assume
patient

give
jab
cloth
counter
driven
cage
shirk
hit

LIST NO. 13.

cricket
last
swarm
squeel
rid
barb
ink
cause

crumble
glance
yearly
railway
clasp
vast
sub
confuse

mid
clause
want
haunt
drear
star
hardly
den

monster
launch
fleetly
law
warn
grasp
jaunt
teacher

mix
orange
case
century
well
swath
ten
unison.

LIST NO. 14.

dreary
limit
pepper
dim
leaf
element
immense
wreath

weave
she
hawk
calf
taunt
dispose
fir
oat

message
waltz
salt
engine
disturb
fault
warble
sup

tray
gallant
please
gleen
due
iron
master
pup

confide
read
sharp
use
half
charge
victory
vaunt

LIST NO. 15.

mum
beef
haunch
prophet
craft
calm
guard
tremble

saucer
jug
oil
farm
survive
shaft
market
ocean

leaves
way
instead
fawn
sauce
link
approve
pen

squawk
any
palm
reading
harsh
dawdle
pledged
marsh

reason
left
ply
legally
apt
with
heart
halves

LIST NO. 16.

top
scald
reigned
fleece
edge
shawl
herd
crease

subject
tax
ripe
dwarf
observe
bug
breeze
squared

sea
accept
altar
sign
black
garden
obliged
deep

out
wagon
effects
falter
wide
cue
decimal
length

cot
eager
disk
hearse
alarm
counted
tab
term

LIST NO. 17.

space
rate
explode
hay
advise
fig
work
agitate

aware
months
escape
cart
acted
mat
baptize
busy

judge
dip
during
cypress
rush
model
declare
axe

remark
oar
shift
expect
bearded
dust
ill
fort

relate
peace
decorum
wedge
paw
better
side
equator

LIST NO. 18.

mirror
index
lid
albumen
test
twice
caught
has

tact
default
bite
barrier
appear
beg
avail
lines

insist
fainted
hip
blow
fix
member
serve
example

exit
eye
bridge
cause
beaming
like
wise
clerk

excited
weapon
act
nod
unity
vary
faculty
attack

LIST NO. 19.

elm
cool
agree
annual
alimony
year
effort
did

arise
deliver
for
enorm
fanatic
engage
riot
here

gun
peril
ignore
bayonet
winking
aloft
menace
pat

hall
mason
belief
evident
off
gaze
leg
start

affect
free
failure
among
anatomy
lest
jar
entire

LIST NO. 20.

where
expand
bond
almanac
pie
wire
terror
crews

barbary
rug
late
object
bob
speed
demerit
acute

hint
figured
fat
profit
real
single
heather
beams

hue
wipe
route
winding
dog
sough
least
afford

faintly
rub
vain
maple
gain
recall
willing
pit

LIST NO. 21.

odd
house
remedy
plot
alumnus
fine
chirp
between

social
map
green
nation
cure
citizen
kin
void

strain
couch
coaster
jaw
profit
blotter
rout
fit

ounce
rough
emerald
impose
dew
book
patron
crime

bid
England
date
youth
strike
feather
ape
side

LIST NO. 22.

old
origin
rise
extra
America
sour
editor
fatigue

new
scene
light
lad
wait
benzene
friend
cent

supply
solve
keg
clatter
stern
advice
stir
density

fad
body
events
guard
box
emperor
prize
hen

tint
bolster
theory
grit
skill
relate
rat
enclose

LIST NO. 23.

rest
months
trust
ammonia
ebb
auto
ode
turned

steam
empower
ample
nun
permit
till
bequest
admit

beef
reveal
enlarge
met
whole
idea
refuse
blister

jig
diamond
itself
light
deep
mud
civil
owl

ease
energy
epistle
big
gate
develop
voice
breeze

LIST NO. 24.

polite
anarchy
stood
him
sign
equal
number
fan

festive
road
bin
sale
fashion
mutiny
story
Belgian

plane
gossip
good
ray
descent
notes
accept
mix

exit
big
rally
tune
fetched
define
exert
time

reside
jot
widely
many
local
gem
attend
destiny

SAMPLE TELEGRAMS.

The following list of practice telegrams was obtained through the courtesy of Col. J. B. Allison, of the Signal Corps:

1.

From: Col. Leslie McClean, commanding 119th infantry regiment.
At: Front line trench—Belgium, Sheet 28 N. W. Edition 3B.
Map location: B. 7. b. 7. 3.
Date: 2/13/16.
To: Col. Robert Jones, commanding 14th infantry regiment.

You will collect all dirty socks and have same sent down with ration party to-night
aaa.

2.

From: Col. William Woods, Commanding 13th infantry regiment.
At: Front line trench, Trench Map—Roelincourt 51B N. W. 1. Edition 5A.
Map location: B. 13. a. 8-1/4. 8.
Date: 2/18/17.
To: Col. Robert McArthur, commanding 14th infantry regiment.

Gas alert will be on until further orders from Brigade aaa.
Have six men and N. C. O. report at once to proceed on machine gun course aaa.
These men will be rationed for 24 hours aaa.
All men will be paid 24 francs by your paymaster aaa.
Ascertain at once location of trench mortar firing on your front line between B. 13. a. 8-1/4. 7 and B. 13. a. 8-1/4. 6 aaa.
Report at once to these headquarters amount of reserve ammunition in your front line trenches aaa.
How many trained machine gunners have you in your Battalion aaa.

3.

From: Col. William Brush, commanding 123rd infantry regiment.
At: Front line trench,—France—Sheet 36B—Edition 6.
Map location: B. 7. d. 8-1/4. 6.
Date: 3/15/17.
To: Col. E. J. Long, commanding 121st infantry regiment.

Have your billeting officer proceed to Bruay to investigate billeting for your Battalion aaa.
Proceed at once to Town Major aaa.

4.

From: Capt. Sam Gibson, commanding 3rd infantry regiment.
At: Front line trench Roelincourt 51B N. W. 1 Edition 5A. Scale 1 : 10,000.
Map location: B. 7. d. 6-1/2. 9-3/4.
Date: 2/13/17.
To: Col. James Rocker, Commanding 34th infantry regiment.

Report at once if any signal was seen from any sector being dropped from airplanes, this A. M. at 10.15 aaa.

5.

From: Col. Walter Scott, commanding 45th infantry regiment.
At: Front line trench, Belgium—Sheet 28 N. W.
Map location: B. 7. d. 8-1/4. 6.
Date: 3/15/16.
To: Col. A. R. Maxon, commanding 17th infantry regiment.

You will be relieved by the 126th infantry Bn. on the night of Feb. 26 aaa.
Relief will be complete by 10.30 of this night aaa.

6.

From: Col. James Brown, commanding 122nd infantry regiment.
 At: Front line trench, France, Sheet 36B—Edition 6.
 Map location: A. 7. d. 6.
 Date: 2/14/17.
 To: Col. Frank Rashen, commanding 124th infantry regiment.

Lieut. E. R. Townsend will report to Battalion Headquarters at once aaa.

7.

From: Col. John Doe, commanding 121st infantry regiment.
 At: Front line trench, Trench Map, France, Sheet 36B, Edition 6.
 Map location: B. 7. d. 6-1/4, 9-3/4.
 Date: 2/16/15.
 To: Col. E. J. Long, commanding 5th Infantry Regiment.

You will raid front line trench at 10.15 to-night aaa.
 Raiding party to consist of one officer, 2 N. C. O.'s and 20 men aaa.
 You are to enter enemy's front line system aaa.
 Ascertain all information possible aaa.
 Bring back any prisoners you can aaa.
 Prisoners will be escorted to Brigade Headquarters for examination aaa.

8.

From: Col. Clarence Buck, Commanding 43rd Infantry Regiment.
 At: Front line trench; Trench Map—Belgium, Sheet 28 N. W. Edition 3B.
 Map location: B. 7. b. 7. 3.
 Date: 2/16/17.
 To: Col. James Doe, commanding 124th Infantry Regiment.

You will relieve front line system the night of Feb. 19 aaa.
 Relief to be complete by 12 o'clock midnight on this date aaa.

9.

From: Col. James Dawson, commanding 15th Infantry Regiment.
 At: Front line trench, France—Sheet 36B—Edition 6.
 Map location: B. 8. c. 2. 2.
 Date: 2/15/16.
 To: Col. Robert Burns, commanding 43rd Infantry Regiment.

Detail 25 men, 2 N. C. O. to report to these headquarters on March 2nd at 10.00 A. M.
 to proceed on forestry work aaa.
 These men will be assigned for 15 days aaa.
 Twenty-four hours rations will be carried aaa.
 They will be paid 20 francs in advance aaa.

10.

From: Col. John Doe, commanding 121st Infantry Regiment.
 At: Front line trench, Trench Map, Roclincourt, 51B, N. W. 1. Edition 5A. Scale
 1 : 10,000.
 Map location: B. 7. b. 7. 3.
 Date: 3/15/16.
 To: Col. James Luckey, commanding 134th Infantry Regiment.

You will raid front line trench at 10.15 to-night aaa.
 Raiding party to consist of one officer, 2 N. C. O's, and 20 men aaa.
 You are to enter enemy's front line system aaa.
 Ascertain all information possible aaa.
 Bring back any prisoners you can aaa.
 Prisoners will be escorted to Brigade Headquarters for examination aaa.

11.

From: Col. Fred Dunn, commanding 65th Infantry Regiment.

At: Front line trench—France—Sheet 36B—Edition 6.

Map location: B. 8. d. 8-1/4. 6.

Date: 2/15/17.

To: Col. Colin Osborne, commanding 43d Infantry Regiment.

You will keep up during the night of March 1st an intermittent indirect machine gun fire on trench—Map location A. 46.7 aaa.

12.

From: Col. James George, commanding 23rd Infantry Regiment.

At: Front line trench—France—Sheet 36B—Edition 6.

Map location: B. 7. d. 8-1/4. 6.

Date: 3/15/16.

To: Col. Sam Jones, commanding 45th Infantry Regiment.

Report at once to headquarters any activities noticed by you of the enemy aaa.

You will send in situation and wind report at 9 a. m. and 5 p. m. daily aaa.

13.

From: Col. Herbert Rankin, commanding 143rd Infantry Regiment.

At: Front line trench—Rolincourt 51B N. W. 1. Edition 5A.

Map location: B. 8. d. 6-1/2. 9-3/4.

Date: 2/13/17.

To: Col. Frank Sylvas, commanding 146th Regiment.

All officers will report at once to Battalion Headquarters aaa.

14.

From: Col. John Enright, commanding 45th Infantry Regiment.

At: Front line trench, Belgium, sheet 28 N.W. Edition 3B.

Map location: A. 17. b. 5. 7.

Date: 3/1/16.

To: Col. L. J. Platt, commanding 31st Infantry Regiment.

Detail 25 men and one officer to report to Engineer's dump at 3:10 on the afternoon of March 1st—map location—A. 17. b. 6. 7.

They will be met by Lieut George James who will conduct them to their work aaa.

15.

From: Col. Herbert Hood, commanding 121st Infantry Regiment.

At: Front line trench—Belgium, sheet 28 N. W. Edition 3B.

Map location: A. 17. b. 6. 7.

Date: 2/13/16.

To: Col. James Robinson, commanding 34th Infantry Regiment.

You will send out tonight, March 15, two patrols aaa.

One between the hours of 12 M. and 2 A. M. aaa.

The other between the hours of 2 A. M. and 4 A. M. aaa.

Patrol to consist of one N. C. O. and four men aaa.

They will patrol between map locations B. 17. b. 6. 7 and B. 17. b. 5. 6.

16.

From: Col. Robert Dodds, commanding 56th Infantry Regiment.

At: Front line trench, Trench Map—Rolincourt 51B N. W. 1. Edition 6A.

Map location: B. 13. a. 8-1/4. 8.

Date: 2/18/17.

To: Col. James Rook, commanding 65th Infantry Regiment.

At 2.15 P. M. this date heavy artillery will open fire on Map location B. 12. a. 7. 7. which will keep up intensive fire for 15 minutes aaa.

Your men will open a slow rate of rifle fire on the enemy trenches aaa.

50

17.

From Untersee Boat U. Zweiundzwanzig.
At Meer aus Haken des Unter Lands.
18 des Marzes 6:30 AM No. 39.
To Grund des Kriegsflottes, Hamburg.

Vier Krieges Booten des Fiendes gesehen waren um Halb sieben. heute Morgan sie
fahrten nach Osten. Schmidt, Kapitan.

18.

From Ordnance Depot.
At Cherbourg, France.
10 Mar. 18 2:19 PM No. 40.
To Chief Ordnance Officer, Washington, D. C.

Transport Beuford arrived this morning 8,000 tons munitions clears tonight.
Darcy, Port Captain.

19.

From Collector of Customs.
At Port Townsend, Washn.
1 Jul. 18 3:17 PM No. 41.
To Secretary of the Treasury, Washington, D. C.

Cutter Snohomish picked up jollyboat containing eight survivors of transport Dix,
which floundered off Table Rock last night. Any information throwing light on
disaster impossible until survivors can be interviewed. Addison.

20.

From Hangar 13.
At Dillman Field, France.
1 Aug. 18 2:34 AM No. 42.
To Col. O'Brien, Chief Signal Officer, Havre, France.

Machines 1360 and 2361 not returned. Absent sixteen hours. Murray.

21.

From 3rd Sanitary Train.
At 4th Brigade Hq.
12 Sept. 18 3:12 AM No. 43.
To Sanitary Officer, 5th Brigade, Hougemont, France.

Request that musicians not on duty be assigned to this train as sanitary inspectors.
Fillion, Lieut.

22.

From 3rd Provisional Seamen's Brigade.
At Nieuport, Belgium.
1 Mar. 18 3:42 PM No. 47.
To Commanding General A. E. F., France.

This brigade landed this morning. Propose to attack ten AM. Have begun heavy
barrage from Monitors. Enemy replying vigorously to their fire.
Ward, Comdg.

23.

From Lieut. Butler.
At Rheims.
13 Oct. 18 3:19 PM No. 48.
To Capt. Murphy, Hq 6th Field Bn., Soissons.

Just learned of your arrival. Congratulations. Butler.

24.

F C Jenkins Comdr. S. S. Chester:
Proceed to Brooklyn at once and await further orders. You will be allowed three
days time for coaling. Bullard.

25.

Lieut H V Harding Co A 1st Bn:
Observation Balloon No 5 reports column artillery moving along road south of Hill
26. Range 8000 yards. Sergt Donath.

51

26.

From Commanding General 3rd Division.

At Langsieg.

16 Feb 18 3:05 PM No. 49. Radio.

To Commanding Officer Artillery Brigade.

Send six batteries horse artillery to report commanding officer advance guard, Atchison Cross, ammunition train to follow immediately.

Miller, Comdg 3rd Div.

27.

From Cavalry Patrol No. 4.

At Frenchmans.

16 Feb 18 2:30 PM No. 4. Buzzer.

To Commanding Officer Advance Guard.

Patrol fired on by enemy cavalry. Patrol of apparently twenty men one mile east of this point. Have taken cover on creek bank. Shall I try to hold this point or return?

Davis, Sgt.

28.

From Contact Patrol No. 1.

At Wilsons Farm.

15 Feb 18 10:10 AM No. 1. Foot Messenger.

To Outpost Commander Thyers Courthouse.

Enemy cavalry about 2 troops riding south. Great activity in camp. Am going forward to point 62.

Trevor, Lieut.

29.

• From Officers Patrol No. 1.

At Point 48.

10 Feb 18 7:55 AM. No. 1. Foot Messenger.

To C. O. 5th F. B. S. C. Point 100.

Enemy trench about one regiment on Lecompton Road due south. Artillery taking position on high ground to southwest. Will remain in observation.

Trevor, Lieut.

30.

From 7th Railroad Engineers.

At Paris, France.

17 Feb. 18 3:25 PM. No. 44.

To Chief of Engineers, Washington, D. C.

Regiment badly in need of experienced railroad telegraphers and despatchers. Suggest transfers of men that may be qualified for railroad service from the various field units as they can be replaced.

Honetschlager, Major.

31.

From Remount Depot.

At Nancy, France.

17 Feb. 18 2:33 No. 45.

To Chief Quartermaster, 6th Division, Boulogne, France.

Three hundred horses, two hundred fifty pack mules and two hundred draft mules forwarded this morning.

Clancy, Colonel.

32.

From Pack Train 6.

At en route.

12 Mar. 18 12:01 AM. No. 46.

To Chief Packer, 3rd Brigade, Vosges, France.

Epidemic glanders prevalent this train. Eighty animals incapacitated on morning report. Need another veterinarian badly.

Queen.

33.

From First Aid Station.

At Front line trench.

5 Sept. 18 12:45 AM. No. 49.

To Base Hospital No. 1.

Five seriously injured enemy raid at midnight. Immediate attendance necessary to save life.

Beardsley, Lieut.

34.

From Picket line, 3rd Cavalry.
At Roulers, France.
3 Dec. 18 6 PM. No. 50.
To First Sergeant, Co. A 6th F. Bn., Hq.

Three pack animals crippled in to-day's marching. Cannot be used for several days.

Hughes, Sgt.

35.

From C. O., Co. "A" 99th Infantry.
At Sector 17.
25 Oct. 17 3:50 AM. No. 9. Telegraph.
To Commanding General, Fourth Brigade.

Small force enemy attacked at three AM Sector seventeen were driven off after ten minutes fighting with a loss five killed several wounded including three prisoners, our loss Corporal Smith killed, Private Johnson and Peck slightly wounded.

James, Lieut.

36.

From C. O., Co. "A" 5th Field Battalion, S. C.
At St. Marie.
26 Oct. 17 11:20 AM. No. 12. Telephone.
To Commanding Officer, 5th F. Bn.

Large radio set and truck totally destroyed by enemy shell. Rush reserve equipment to LaBoyne.

Holmes, Capt.

37.

From C. O., 5th F. Bn., S. C.
At Sedan.
25 Oct. 17 11:50 AM. No. 9. Buzzer.
To C. O., Co. "A" 5th F. Bn. S. C.

Send an officer and fifteen enlisted men including two radio operators to report to Commanding Officer Seventy-seventh Infantry near Vosges.

Franklin, Major.

38.

From C. O., 134th Infantry.
At Vosges.
25 Jan. 17 10 AM. No. 6 Radio.
To C. O., 19th Cavalry.

Send troop cavalry to Point ninety-seven to relieve troop there now.

Williams, Major.

39.

From C. O., 7th F. Bn., S. C.
At Xaviers.
23 Nov. 17 9 AM. No. 3. Radio.
To C. O., 1st F. Artillery.

Sergeant Johnson with eight men reporting to you to-night to keep all buzzer lines in repair.

Jones, Capt.

40.

From C. O., 72nd Infantry.
At Duncourte.
15 Jan. 18 8:30 PM. No. 1. Telegraph.
To C. O., 2nd F. Signal Bn.

Arrange for radio communication between these headquarters and Commanding Officer Third Battalion at Point two hundred yards east Summit Hill for nine seven, position to be taken up at seven AM. seventeenth January.

Evans, Major.

41.

From Pennington's Scouts.
At Jarboe.
16 Feb. 18 4:40 PM. No. 4.
To C. O., 41st Division, Fleurville.

Wire entanglements fifty yards deep front Dubois woods distance half-mile.

Jameson, Captain.

53

42.

From Division Surgeon, 14th Division.

At Colby, Ida.

16 Feb. 18 4:40 PM. No. 2.

To O. J. C., Medical Supply Depot, St. Louis, Mo.

Send at once by mail one hundred cubic centimeters vaccine virus. Epidemic threatened.

Cole.

43.

From S. C. Repair party.

At Gulkana, Alaska.

16 Feb. 18 4:40 PM. No. 1.

To Signals Valdez.

Repairs Egbert-Gulkana line completed date. Insulation resistance seven hundred megohms.

Anderson.

44.

From Inf. Patrol No. 4.

At 500 yards N. W. Lansing.

15 Feb. 18 9:10 AM. No. 4.

To C. O. Co., A 4th Infantry, Loudon.

Hostile cavalry patrol twenty men now south of Unalakleet moving west on Kaltag-Nulato road, will remain in observation.

Wescott, Sgt.

45.

From Patrol no. 2.

At East slope Plum Hill

10 May 18 5:10 PM. No. 1 Foot messenger.

To division commander. Wade Schoolhouse.

Great activity on other shore of river. About one regiment preparing to cross. Will await further orders here.

Trevor, Lieut.

46.

From reconnoitering patrol No. 1.

At point 96.

15 Feb. 18. 9:10 PM No. 1 foot messenger.

To the C. O. 5th F. B., S. C. Division hqrs.

Have engaged enemy patrol about 20 men, captured two, returning them with messenger. They refuse to talk. Will remain in observation.

Trevor, Lieut.

47.

From second brigade headquarters

At point No. 9

16 Feb. 18 8:45 AM No. 1 Buzzer

To Third Division Commander, Point Number 105

Second Brigade will camp tonight at point Number 80 and will be in position at six A.M. February seventeenth.

McGray, Commanding.

OK NK TD 9:20 AM

48.

From Cavalry Patrol No. 3

At 500 Yards S. E. Corner Ranch

15 Feb. 18 10 AM No. 2 Wireless

To Commanding Officer Hachta, N.M.

One hundred Mexicans camped at Ascension last night moved south at eight AM this morning.

McCarthy, Sgt.

OK MD JD XX 10:10 AM

54

49.

From Chief Surgeon
At Dublin Mexico
18 Feb 18 9 AM No. 5 Wireless
To Surgeon, Camp Hospital, Columbus, N.M.

Hospital train left at eight forty-five enroute to Columbus with forty-six to be sent to Base Hospital at Fort Bliss Texas train will arrive at Columbus six PM this date.
Baker.

OK NK HJ 9:25 AM

50.

From Signal Post 25.
At Old Church Crossroads.
12 Mar. 18 1:19 AM. No. 19.
To Major Bell, 7th Brigade, 14th Div'n, 3rd Army Hd'qrs.

Enemy massing artillery on left flank. Large bodies troops moving east on Luneville Pike. Airplanes very active.

Fritchey, Capt.

51.

From FGMCZ WMJKT
At GLBLC NRQBR GUECM
17 Feb. 18 1:14 PM No. 21
To NRACW, URCAX SCUTG LXUBX RSGRQ JWXUT
SRNMZ BXRMT GXDJG EVGAC MLXTT
CRMGU TXMCJ TXEMG UDJGP GSGMF

LWIZGS

(Prearranged semaphore code)

52.

From EWSSX MMGRQ
At FRXAG DCZYR
13 Feb. 18 1:17 PM No. 21
To EZXCB EWSMQ BWNRT ZDXKU, FCLXH CBRGU
ECMZ X JSCUT MWBBW RGACF GDLQD
CLGQC DGEEW NUTEW UACMT XWUDT
EZCRF WNRAM NAACM TFNXL DXUAT
ZXRDR GXLMQ MTCSI

LGVCM

(Prearranged Semaphore code)

53.

From Observation Post.
At Hill 21.
15 Jan. 18 11:01 AM No. 22.
To C. O., 6th Division, Nancy, France.

Enemy launched surprise attack this morning. Eight killed three wounded two missing. Casualty list later.

Kierman, Brig-General.

54.

From Hq's 4th Field Artillery.
At Calais, France.
12 Nov. 18 1:11 AM No. 23
To Chief Quartermaster, 3rd Division, Boulogne, France.

Badly in need seventy ponchos, hundred tent pins, six aparajos, twenty tarpaulins, thirty mess kits in substitution for those lost in recent retreat. Inconvenience great.
Crowley, Quartermaster.

55.

From 310th Field Bn.
At 4th Brigade Hdqrs.
1 Mar. 18 3:18 PM No. 24
To M. S. E. 310 th F. Bn, Div'n Hqrs, Chemin des Dames, France

Rush detector points and selector rings for company A this battalion requisitioned last communication.

Haskell, Acting First Sgt.

55

56.

From U. S. A. T. Yantic.

At sea.

10 May 18 4:16 PM No. 25.

To Commandant Navy Yard, Brooklyn, N.Y.

Due about nine am tomorrow for turbine repairs.

Howell, Capt. Comdg.

57.

From Lyons, France

At _____

17 Feb. 18 1:11 PM No. 26

To General Paux, a Paris

Le general Joffre va prandre par dant la parrade mardi le dix de mars un mille neuf cent dixhuit.

Corbaux, Adj. Gen.

58.

From Brussels, Belgique.

At _____

1 Mar 18 3:02 PM No. 27.

To Department D'Telegraphie sans fils, a Bordeaux, via Paris.

Une nouvelle station a ete etablie sur le champ de Waterloo.

Trombley, Le Capitan.

59.

From Company B

At Sundbury, England

(Not dated) 1:33 AM. No. 28

To Capt. Blake, Landsend, England

To-night we will use the coston signals. See cipher yesterday for key.

Whiley.

60.

From JJNEE HXGRH

At HIRBP

12 Apr. 18 2:15 PM. No. 29

To MPMP, VUPGS FYACE

BNHLS PFFII RZBTE DHEQV FGSNT DVKIG FZBTE VDPMI
GWSIB TCPQP

KCXRZ

(Secret Wireless Code. Key word: ROPE).

61

From Third — Section

At 3rd Cavalry Hq's

4 Apr. 18 5:18 PM. No. 30

To Capt. Murphy, Division Headquarters

Reached cavalry headquarters and established station. all well. Handling business with little delay.

Romig, Sgt.

62.

From Le sector Francais

At Peronne

4 Mars 18 11:50 PM. No. 31

To Avant poste No. 2, St. Marie

Une detachement arrivera ici demain matin a cinq heures avec les detail du terrain.

Le Quartier General.

63.

Lieut. Jas. Twining Co B, 1st Bn:

Outpost detachment reports infantry moving north along River road. Range 3,000 yards.

Sergt. Johnston.

56

64.

Capt B F Young Qmrc Fort Wood N. Y.:

Furnish Sergt H H Bevans Co A 1st Bn line and Pullman transportation Key West Aviation Field to New York City. The journey is necessary for the public service.
Lieut. W. C. Willis, Adjutant.

65.

Mjr H G Opdycke S. R. C. Army Bldg New York City:

Requisition No 14569 short 100 slickers 150 condiment cans 400 woolen shirts 25 blouses size thirty-eight 50 automatic holsters. Rush via express.
M. C. Neale.

66.

Col L R Kelley Federal Bldg. Chicago:

Lieut W H Taylor this date reported to Adjutant Ford Wood N Y. Radio further instructions as to his ultimate destination.
Capt. C. O. Bickelhaupt, SRC.

67.

All Ships:

S S Tenadores reports obstruction to navigation long. 60 north lat. 20 west. Derelict about two feet out of water. Destroy if possible.
Bullard.

68.

Comdr U S S Birmingham

Aground off Barnegat Light. Heavy sea running. Stand by to take off troops in morning if necessary. Will radio condition every hour.
Zimmerman.

69.

Flag Officer U S S Wyoming

16985, ab236, egi56, 59abe, 13568, 90618, 4103a, na516, e9064, vk321, 23219, 10784, 135kl.
Bullard.

70.

Col L R Kelley Chicago Ill.

Sergts W McFarland H J Roach Corporals B R Grasser C A Brandon Pvts Harvey Boarts Ed Much W J Johnston injured by bursting gun barrel at Sandy Hook testing ground. All men from Chicago.
J. H. McCandless, 1st Lt USR.

71.

From U. S. A. T. Germania.

At sea.

15 Mar. 18 8:03 AM No. 32.

To Officer Commanding, Port of Debarkation, France.

Enemy submarine chasing. Succeeded in eluding for time being. Change of course made necessary. Will be delayed indefinitely will keep you advised. 2,987 souls aboard.

Hennessey, Commander.

72.

From Headquarters central department.

At Chicago, Ill.

8 Aug. 18 2:13 PM No. 33.

To Post Commander, Ft. Slocum, N. Y.

Nine hundred eighty signal corps recruits reach your post tomorrow morning. Movement necessary account crowded conditions this post.

McBee, Recruiting Officer.

73.

From Ambulance Unit No. 9.

At 3rd Brigade hq.

19 Apr. 18 9:30 AM No. 34.

To Surgeon General, Washington, D. C.

Culture sergeant Myron F. Jones 3rd Field Artillery indicates spinal meningitis.
Brown, Surgeon.

57

74.

From V-17.
At North End.
10 Apr. 18 9:04 AM No. 35.
To Chief Plotter, Artillery Fire Station, Point H.

Shells timed too short. Increase five seconds.

Donaldson, Observer.

75.

From Sixth Cavalry Patrol.
At village of De Russy.
20 Nov. 18 4 PM No. 36.
To C. O., Sixth Cavalry, Carpentier, France.

Enemy falling back roads choked with ammunition trains. Great confusion.
Lamping here tonight.

Brigham, Lieut.

76.

From Engineer Train 18.
At En route.
9 Dec. 18 3:24 PM No. 37.
To Commanding Officer, 10th Engineers, Poissy.

Three trucks disabled and abandoned three hundred yards southwest point 9.
Mechanicians Asherman and Weber left in charge.

Babcock, Capt.

77.

From Third Section.
At St. Michael, Alaska.
10 June 18 2:33 PM No. 38.
To C. S. O., Seattle, Washn.

Yukon broke yesterday. Entire line between Nenana and Kaltag gone out. Business moving slowly via wireless.

Dixon.

78.

From Western Department.
At San Francisco, Cal.
18 Feb. 18 9 AM No. 8.
To Woods, Fort George Wright, Washn.

Advise very promptly first by important office ending
wire this my week number information reach enlistments.
McCain.

79.

From Parade Grounds.
At Signal Corps Contonments.
16 Feb. 18 5 PM No. 9.
To Commanding Officer, 6th F. Bn., S. C., Headquarters Building.

The fact that two commissioned officers did not pay "attention" to the colors being sounded at retreat here this evening while they were passing along the boulevard facing this barracks is called to the major's attention for such action as deemed necessary.

Bramley, Capt.

80.

From UGMBE.
At KFXUP.
16 Feb. 18 2:22 PM No. 10.
To UIRQB CGBTM.

FHWED OJHTI LRKHA SWBEG NHGAS LDBIT OCMHE RBAUP
MKKSQ CYMXG COARU RLVIB QIDJU PIKHC

PMKIH

(Playfair cipher used. Read up and to the right.) (Key word: Bears.)

58

81.

From Second Section.
At Fairbanks, Alaska.
12 Feb. 18 6:02 PM No. 11.
To C. S. O., Seattle, Washn.

This station copied passenger list of U. S. A. T. Sheridan forty miles off Oahu Island last night.

Collins.

82.

From First Detachment, 3rd eng'rs.
At Point 47.
1 Feb. 18 3:21 PM No. 12.
To Regimental Commander, Corps Headquarters, Bagdad.

Reconnaissance party successful. Information obtained being forwarded secretly. Reach your hands ample time for forming plans.

Boise, Lieut.

83.

From D-5.
At in flight.
16 Feb. 18 3:16 PM No. 1.
To Post 2 American Sector

Enemy in confusion. Range perfect. Apparently much distress.

Bowes.

84.

From 3rd Infantry Brigade.
At Division Headquarters.
16 Feb 18 1:22 PM No. 2
To C. O. 6th F. Bn, S. C., with Cavalry Patrol.

Return to headquarters immediately. Detach one platoon en route and have it establish lines of information between headquarters cavalry patrol and the French cavalry operating in American northwest sector. Acknowledge by radio in cipher giving today's details of your operations.

Hennitz, Brig-Gen.

85.

From First Section.
At Point Y.
18 Feb. 18 1:22 PM No. 4.
To C. O., Co. A, 6th F. Bn, S. C., Headquarters

65 mile velocity wind demolished three sections antenna mast. Giving satisfactory service in using improvised sections.

Please duplicate by first communication.

Baber, Chief of Section.

86.

From Battery X
At Arras, France
19 Feb. 18 3:02 PM No. 5
To C. O., Battery K

F K E O W Z A H J K Q R A N A

Isabell, Capt. Commanding.

87.

From Observation Balloon
At descent
19 Feb. 18 3 AM No. 5
To Enwright, Listening Post 13

Enemy showing activity northwestern sector. No information from that quarter since midnight suggest scout aero squad act in relief of those despatched at one AM. Heavy cannonading by antiaircraft guns indicating possible disaster to our raiders.

Ballou, Pilot.

59

88.

From Headquarters A. E. F.

At Paris, France

1 Feb. 18 3.22 PM No. 7

To Chief of Staff, War Department, Washington, D. C.

Our front lines subjected to bombardment by enemy heavy artillery for two hours Thursday night. One casualty from gas. Men remained cool and courageous all during the engagement, typifying the characteristic American fighting spirit.

Pershing, Commanding.

89.

From Bonts.

At Egzzr Pdnus.

29 Feb. 18 11.22 AM No. 13.

To DOGXN RQHAN RNAGP PMLRN BROHV ANNRO

RTTVJ NRBMR MIGAF TAPMD EHERF GBNGW GZNTA PNHTA TPKGR
XQNAE ANEUK.

XSZVY

(Playfair Cipher: Key word: General)

90.

From SXHIN ITDVA

At TNITN ANSOA

27 Feb. 18 1.09 AM No. 14.

To EDPTM ADOQN EYRNE WOKYN

TRDVS IEIII OTETT NWNYPH OSNMN UADEE IHHNR GTUDE DNME
AIASE AIGNU VNOBF ODEAE

RDLNY

(Fence-rail cipher)

91.

From First Ambulance Unit.

At Verdun, France.

14 Feb. 18 10.02 AM No. 15.

To Surgeon, Bas Hospital, Paris.

231 badly wounded on hospital train leaving 9 AM.

Drury, First Lieut. Med. Cps.

92.

From War Department.

At Washington, D. C.

14 Feb. 18 3.24 PM No. 16.

To C. O. 54th Aero Squad, A. E. F., France.

The adventurous exploit of airman Hascock in bringing to earth the two enemy planes yesterday has electrified the general public as no other act of the present war. His action is highly praiseworthy in view of his extreme youth.

Bamer.

93.

From PTOTO ARLWA

At TRNHE TECTN

2 Feb. 18 11.21 PM No. 17.

To CMGFI ODOFG EFUTB RORHR

IFEON GDPIT KNMRT EYEI RNSOL IGLWY TIKHY HNTEM ENOCU
STOCP YHRRD TIDIG EERIM NADXU DCADL ERNAL

O'BRIEN

94.

From Observation Post.

At Hill 21.

15 Jan. 18 11.01 AM No. 18

To C. S. O., 4th Brigade, La Croix, France

Enemy aero signaling to some point behind our lines near Poissy.

Graham.

60

95.

From: Station U.
At: Point "I."
16 Feb. 18. 10.30 A. M. No. 11. Buzzer
To: Commanding Officer, 7th Division, Washington.

Stock will go forward today.

Waite. Lieutenant.

96.

From: Section Chief 1st Section
At: 200 yds. N. E. Chicago
Date: 16 Feb. 18 11.45 A. M. No. 11
To: Gen. Smith, Fort Smith, Ark.

Furnish me with 20 men at once.

Crouch, Sergeant.

97.

From: C. O. 7th Division
At: Wilson School House
Date: 3 March 18 11.14 a. m. No. 61 Buzzer
To: Capt. Hunter, Point 100

Advise condition wire casts. Be ready to proceed to Mountain Park in A. M.

Wilson.

98.

From: Sec. Chief, 3rd Section
At: Point 100
Date: 16 Feb. 18 10.57 A. M. No. 11 Buzzer
To: Major Arnold, 27th Infantry, Point 76

All lines of communication in first class condition.

Yount.

99.

From: Second Patrol
At: Paeschende
Date: 16 Feb. 18 8.42 A. M. No. 21 Buzzer
To: Chief of Staff, Third Div. Hdqrs., Cambria.

Enemy in this sector being heavily reinforced.

Wharton.

100.

From: Signal Detachment
At: Rio Janeiro
Date: 16 Feb. 18 4.40 P. M.
To: C. S. O. Manila

Station attacked four this morning. Corporal Fleming flesh wound left thigh.
Request motorcycle be sent for him.

Jackson, Acting First Sergeant.

101.

From Quartermaster General.
At Calais.
1 Dec. 18 9:40 AM. No. 2 Buzzer.
To Quartermaster, 3rd Division.

Report if paragraph four bulletin number six Q M G, Washington complied with.
Smith, Comdg.

102.

From Quartermaster 3rd Division.
At Huy, Belgium.
12 Jan. 18 9 AM. No. 2 Radio.
To QM General, Amn Exp Forces, Calais.

Entire command equipped according to bulletin number six.

Jones, Major.

103.

From Division Headquarters.

At Devreaux.

14 June 18 9:45 AM. No. 6 Buzzer.

To C. O., 3rd F. Bn, S. C.

Send one section with five extra men to point one eight four establish communication with these headquarters position to be taken up eight thirty PM. date.

Wilson, Major

104.

From C. O., 3rd F. Bn, S. C.

At Chevreux.

16 July 18 8 AM. No. 7 Radio.

To C. O., 5th F. Bn, S. C.

Arrange for communication by radio between this headquarters and artillery headquarters at point one five six immediately.

Booth, Major.

105.

From C. O., 3rd Brigade.

At Charlemagne.

23 Sept. 18 10:10 PM. No. 3 Buzzer.

To C. O., 92 Infantry.

Ninety third Infantry will relieve your regiment at five ten AM. nineteenth. Arrange proceed to Charlemagne.

Wilson, Brig. General.

106.

From Sergeant Hollister.

At Sector Nineteen.

25 Oct. 18 10:10 AM. No. 2 Radio.

To C. O., Co. "B" 5th F. Bn, S. C.

Need five hundred feet four pair cable immediately.

Hollister, Sgt

107.

From Brigade Quartermaster.

At Chevrolet.

15 Oct. 18 10:15 AM. No. 7 Telegraph.

To C. O., 77th Infantry.

Will pay your regiment at two PM. sixteenth.

Jameson, Qm.

108.

From C. O., 3rd Div.

At Point 32.

16 Feb. 18 1:22 PM. No. 4 Buzzer.

To C. O. Art., Meads Hill.

Report at once condition of ordnance and animals.

Johnson, Brig-Gen.

109.

From C. S. O.

At Near Hund Hill.

17 Feb. 18 4:31 PM. No. 7.

To C. O. Co. B, 5th Fld Sig Bn, Chihuahua.

Report condition of Signal equipment furnish communication between artillery at Hopkins road and brigade headquarters Point 73.

Holeman, Col.

110.

From Cav. Patrol No. 3.

At 100 yds N. E. Kickapoo.

16 Feb. 18 10:25 AM. No. 1 Buzzer.

To C. O. Tr. B, 2nd Cav., Bullrun.

Repulsed hostile cavalry at Hood River sending twenty prisoners. Shall continue east of Kickapoo.

Kilbourne, Lieut.

111.

From C. O. Tr. O, 4th Cav.
At Bismark Meadow.
16 Feb. 18 11:40 AM. No. 9 Radio.
To C. O. Cav. Patrol No. 5, Hubbard Hill.

Extend patrol from Hazel Crossing to Point 41 inclusive. Report condition of animal.

Millwood, Capt.

112.

From Commanding Officer 13th Cavalry.
At Dublan, Mexico.
10 Feb. 18 5:28 AM. No. 3 Buzzer.
To Quartermaster Columbus, N. M.

Rush following rations one hundred sacks potatoes one thousand pounds flour two thousand pounds bacon five hundred pounds onions five hundred pounds sugar. Needed very badly.

Dunbar, Commanding.

OK MK XD 6:06 AM.

113.

From Quartermaster.
At El Valle Mexico.
10 Feb. 18 6 AM. No. 5 Mounted messenger.
To Captain Leary, Truck Train No. 9, Railroad Crossing.

Report condition of roads between Dublan and Big Bend also if you passed train No. seventy-two at Big Bend.

Bassett, Quartermaster.

OK ML JD 6:20 AM.

114.

From Co. G 3rd Infantry.
At Millwood.
3 May 18 7 AM. No. 6 Buzzer.
To C. O. 2nd Bn.

Will proceed to Lowmont at once and destroy stores as directed.

Jones, Capt.

115.

From Outpost Patrol No. 5.
At Point 98.
10 Jan. 18 9:45 AM. No. 1 Foot messenger.
To the Outpost Commander. Point 48.

Driven back by enemy patrol about 10 men just south this point. Send 5 men to reinforce.

Trevor, Lieut.

116.

From Patrol No. 2.
At Easton.
13 Sept. 16 2:05 PM. No. 3 Mounted messenger.
To C. O. Co. M.

Will remain here five hours. Send 500 rounds rifle ammunition at once.

Jackson, Corporal.

117.

From O. O. 3rd Div.
At Fort Leavenworth.
16 Feb. 18 11 AM. No. 24 Radio.
To C. O. 5th Fld Bn S. C.

You will investigate delay sending your message no. 14 and report immediately.

Carter, Maj. Gen.

118.

From First Section.
At Farley.
9 Jan. 18. 6 PM. No. 12. Flag.
To C. O. Co. C.

Troops approaching bridge point 72 from west. Unable to tell number. Will remain in observation.

Jameson, Sgt.

63

119.

From Second Section Co. A, 5th F. Bn.
At point 84.
25 Nov. 17. 9.27 AM. No. 8. Radio.
To C. O. Fifth Battalion.

Company B passed here going west at 9.25 AM.; one cart horse third section very lame
Thompson, Sgt.

120.

From Commanding Officer Advanced Guard.
At Atchison Cross.
16 Feb. 18. 2.40 PM. No. 18. Buzzer.
To Sgt. Davis, Patrol No. 4.

Retire to Blue Cut and take cover on each bank, and engage enemy patrol at long range. Hold position if possible.

Grant, Major.

121.

From Commanding Officer Advance Guard.
At Atchison Cross.
16 Feb. 18. 3 PM. No. 21. Buzzer.
To Commanding General 3rd Division.

Have developed enemy one mile west of Frenchman, am taking position on Sheridan Drive—Artillery Hill, left flank is uncovered. Can you send covering force to Zimmerman Road—Federal Quarry.

Grant, Major.

122.

From C. O. 5th Field Battalion, S. C.
At Sedan.
5 Nov. 17. 9.30 AM. No. 5. Telegraph.
To C. O., 333rd Infantry, Hill 61.

Sgt. Jones and four privates will report at 5 PM. for telegraph installation duty.
Franklin, Major.

123.

From C. O., 19th Field Artillery.
At St. Marie.
25 Oct. 17. 11.10 AM. No. 7. Buzzer.
To Holmes, 13th Field Artillery, Verdun.

Sgt. First Class Rupert has been instructed to report immediately and repair buzzers.
Smith, Capt.

APPENDIX A.

Bibliography.

List of a few suitable books; there may be many equally good:

- Robison, Samuel S. Robison's manual of radio telegraphy and telephony for the use of naval electricians. 4th ed., rev. Annapolis, Md., United States naval institute, 1918. 256 p.
Clear explanations, with diagrams of connections of navy sets.
- U. S. Bureau of standards.¹ Radio instruments and measurements.
Issued March 23, 1918. Washington, 1918. 330 p. (Circular no. 74.) .60
Bibliography: p. 324-329.
- U. S. Signal office.¹ Radio telegraphy, U. S. Signal corps. Revised October, 1916. Washington, 1916. 128 p. .30
Very useful, gives Signal corps sets and connections.
- _____.¹ Regulations governing commercial radio service between ship and shore stations, United States army. Corrected to August 15, 1917. (Changes nos. 8 and 15.) Washington, 1917. 139 p. (Manual no. 2a.) .35
- _____.¹ Signal book, United States army. 1916. Washington, 1916. 64 p. (War dept. doc. no. 500.) .20
- _____.¹ Technical equipment of the Signal corps. 1916. Washington, 1917. 554 p. (Manual no. 3.) \$1.00
(War dept. doc. no. 541.)
- Supersedes Manual no. 3, ed. of 1910, and Manual no. 4, 1905.
- U. S. War dept.¹ Drill regulations for signal troops. Washington, 1917. 462 p. (War dept. doc. no. 606.) .50

APPENDIX B.

The following list of equipment, which may well be used in a class in radio operation, is given as a guide to what may be needed. There is no intention to imply that just this amount or kind of apparatus must be on hand in each class, however.

For a class of 20 students, the following material is suggested, in addition to tables and chairs:

4 dry cells, approximate price, 40 cents each.....	\$1. 60
20 single head receivers, with bands and cords, approximate price, \$2 each.....	40. 00
6 telegraph keys, approximate price, \$1.25 each.....	7. 50
2 buzzers, approximate price, 75 cents each.....	1. 50
Annunciator wire, No. 18, approximate price.....	1. 00
90 snap connectors, approximate price, 5 cents each.....	4. 50
Insulated staples, approximate price.....	. 30
Total.....	56. 40

It will thus be seen that the expense is not excessive. All of the apparatus, except the batteries, will last indefinitely. Sufficient material is indicated for the connections given in Fig. 2, #4, or the diagram in Appendix E. If the Dunwoody generator is used some batteries are also necessary.

¹ May be obtained from the Superintendent of Documents, Washington, D. C., by remitting postal money order, express order, or New York draft for the amount indicated. Postage stamps are not accepted.

APPENDIX C.

The wave meter.

A Wave Meter is of decided importance in practical radio work and in principle is sufficiently simple to be taken up by students in the elementary radio classes. The accompanying diagrams

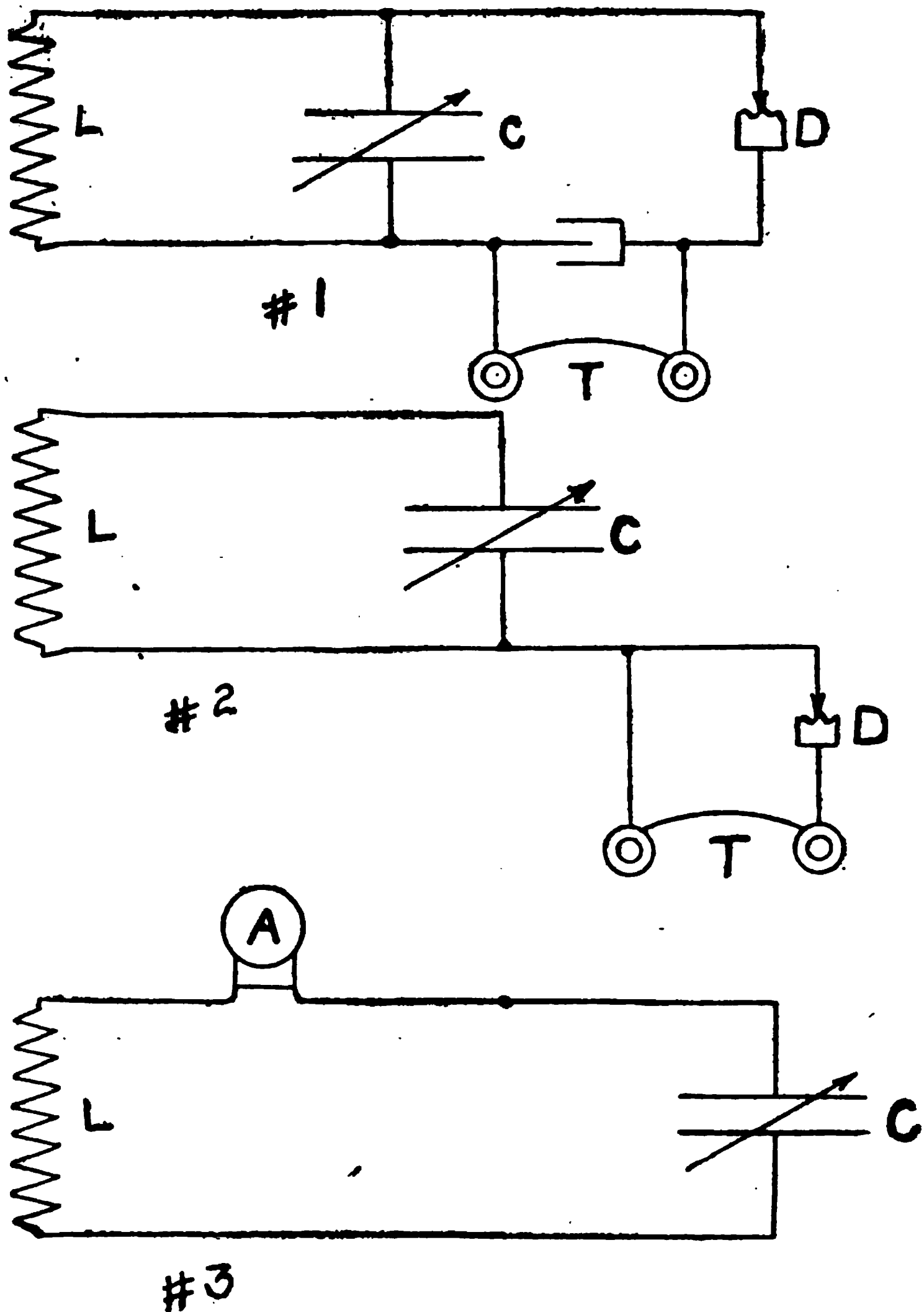


FIG. 3.—Wave meter diagrams. C, Variable condenser; L, inductance; D, detector; T, head phone; A, hotwire ammeter.

show the connections. At "C" is shown a variable condenser, while at "L" is an inductance. In practice several inductances are furnished in order that the meter may be used for measuring waves

of widely different lengths. The variable condenser offers a good test of the shop skill of the student. Diagrams or the pictures of such condensers may be found in several of the texts referred to.

The diagrams of connections indicate the two types, one with the ammeter, another with the telephone, the latter being probably the more useful under Signal Corps conditions. A third type is made in which a vacuum tube replaces the ammeter.

APPENDIX D.

The following drawing indicates a form of wireless generator which may be easily constructed in the shop by the class in radio mechanics.

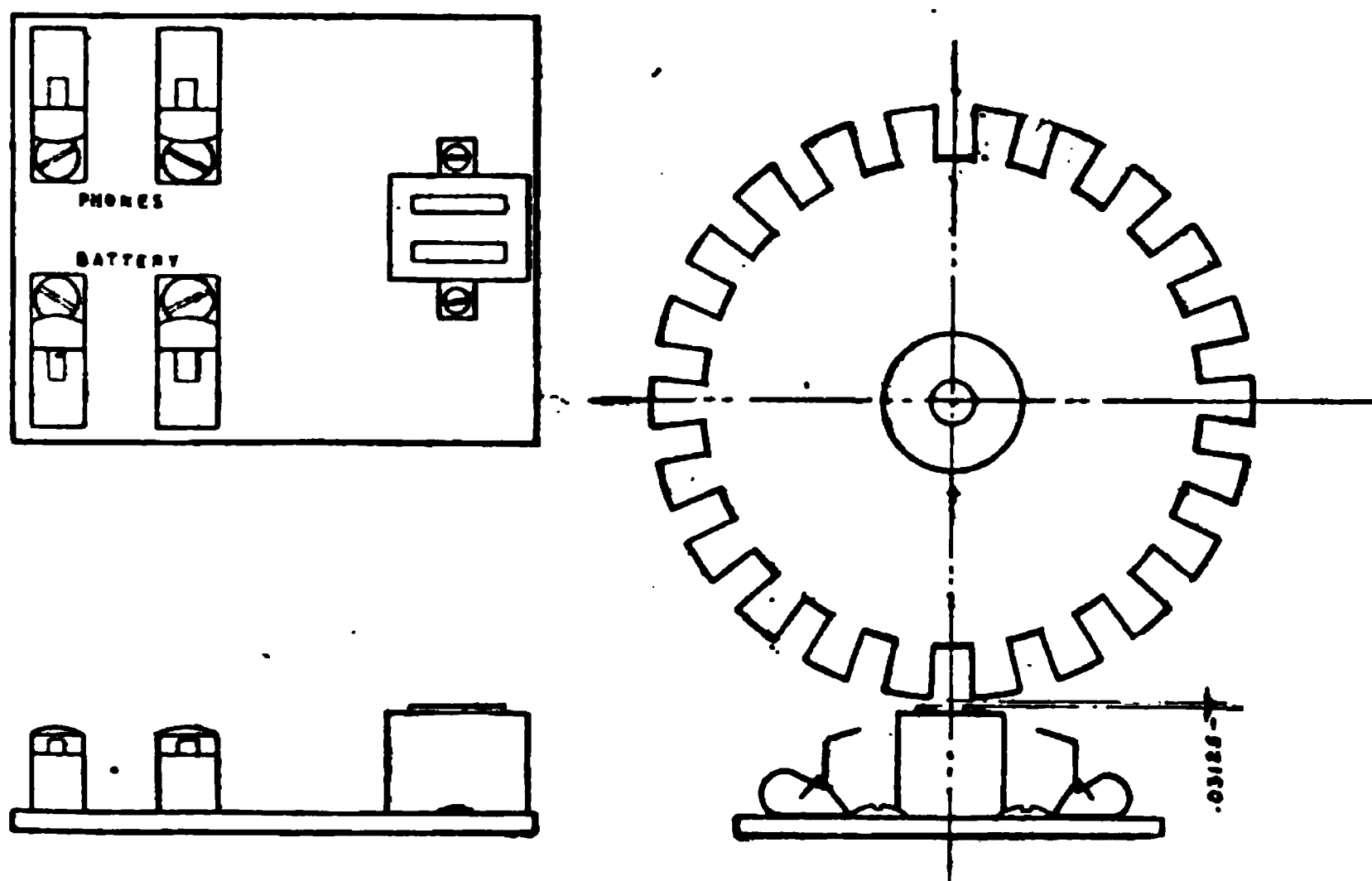


FIG. 4.—Signal generator.

We are indebted for this diagram to the kindness of Dunwoody Institute, Minneapolis. It illustrates very nicely the principle of the inductor alternator.

The disk indicated is mounted upon the shaft of any small motor, the magnet so arranged as to almost touch the rotating disk. By means of a rheostat the speed of the motor can be easily controlled and the pitch of the signal thereby changed to imitate any commercial signal. A battery in series with the line and the magnet is all that is necessary in addition to the disk. The diagram of the connections, which accompanies the drawing of the generator, indicates the connections rather clearly.

This device may well be used not only to generate the current for buzzer operation but to illustrate and explain the principles of electromagnetic induction.

The Alexanderson alternator, which is used in many successful commercial stations, is built on exactly this principle.

APPENDIX E.

The following diagram indicates another set of connections, which may be profitably used in schools for radio operation. By means of ordinary telegraph keys (i. e., keys having a circuit closing lever)

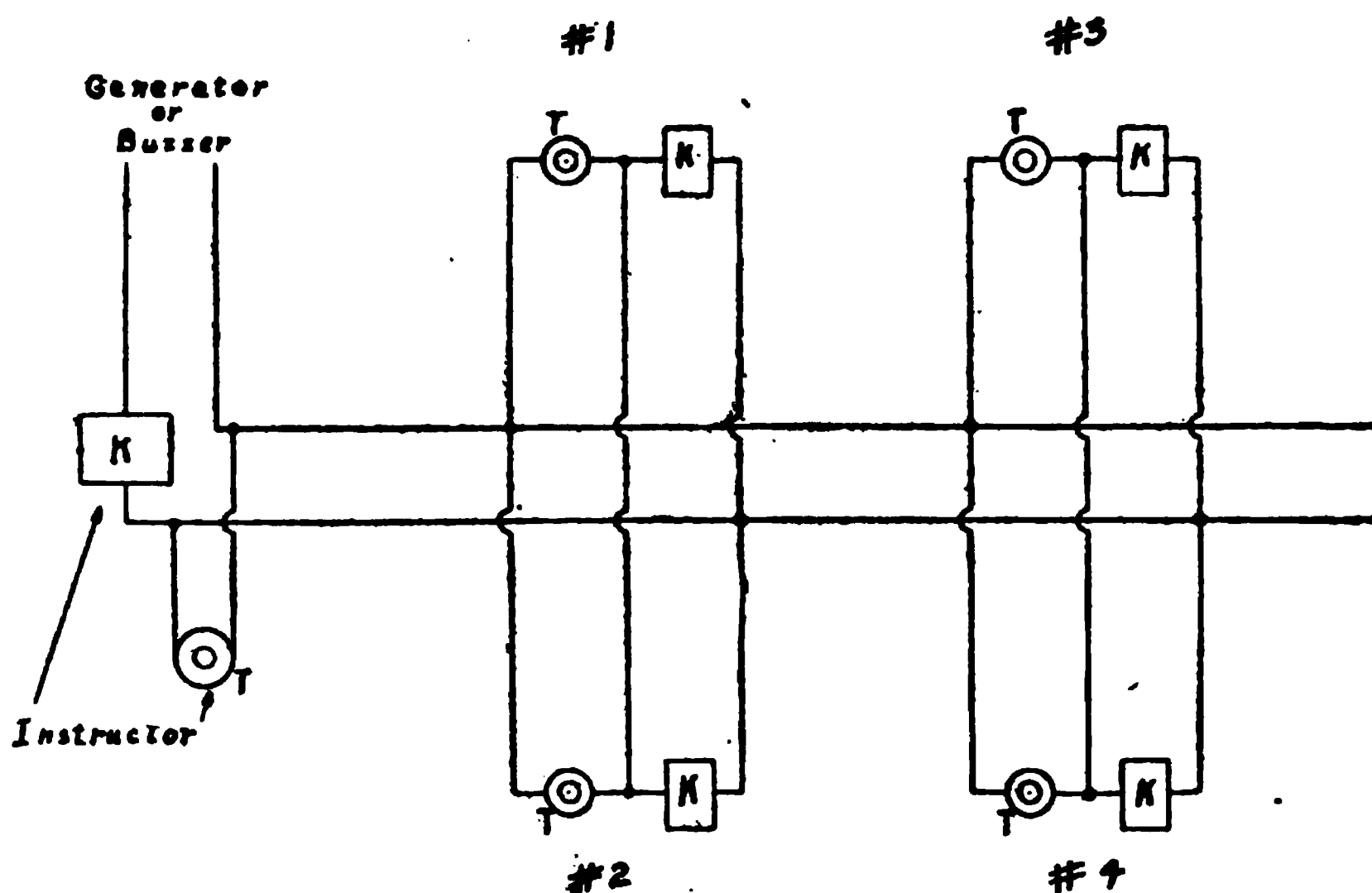


FIG. 5.—Radio connections for group practice. T, Head phone; K, telegraph key with circuit closing switch.

it is possible, by following the connections indicated, for each student to close his key and all receive the sending of the instructor, or the instructor may close his key and sending may be possible between each pair of students, i. e., No. 1 may send to No. 3, and so on. Other circuits may easily be devised by the instructor.

It is suggested that where a laboratory must be used at night for radio operation and during the day for other purposes, connections may be placed upon strips of $7/8 \times 6$ inch spruce or pine, these strips being laid along the regular laboratory benches, and the head receivers and keys passed out to the students. This will obviate the necessity of fitting up laboratory tables especially for this work.

APPENDIX F.

The following sketches are included as suggestive material for shop work. The key given may be constructed of straight strips of metal, with an insulating strip instead of metal to hold the lower contact. The parts may be fastened together by screws or rivets. The reinforcement on the lever involves some work in brazing. The construction of the various parts gives practice in drilling and tapping. The instructor can easily modify the shape of the different parts to suit his individual taste, but a similar design will give practice in the

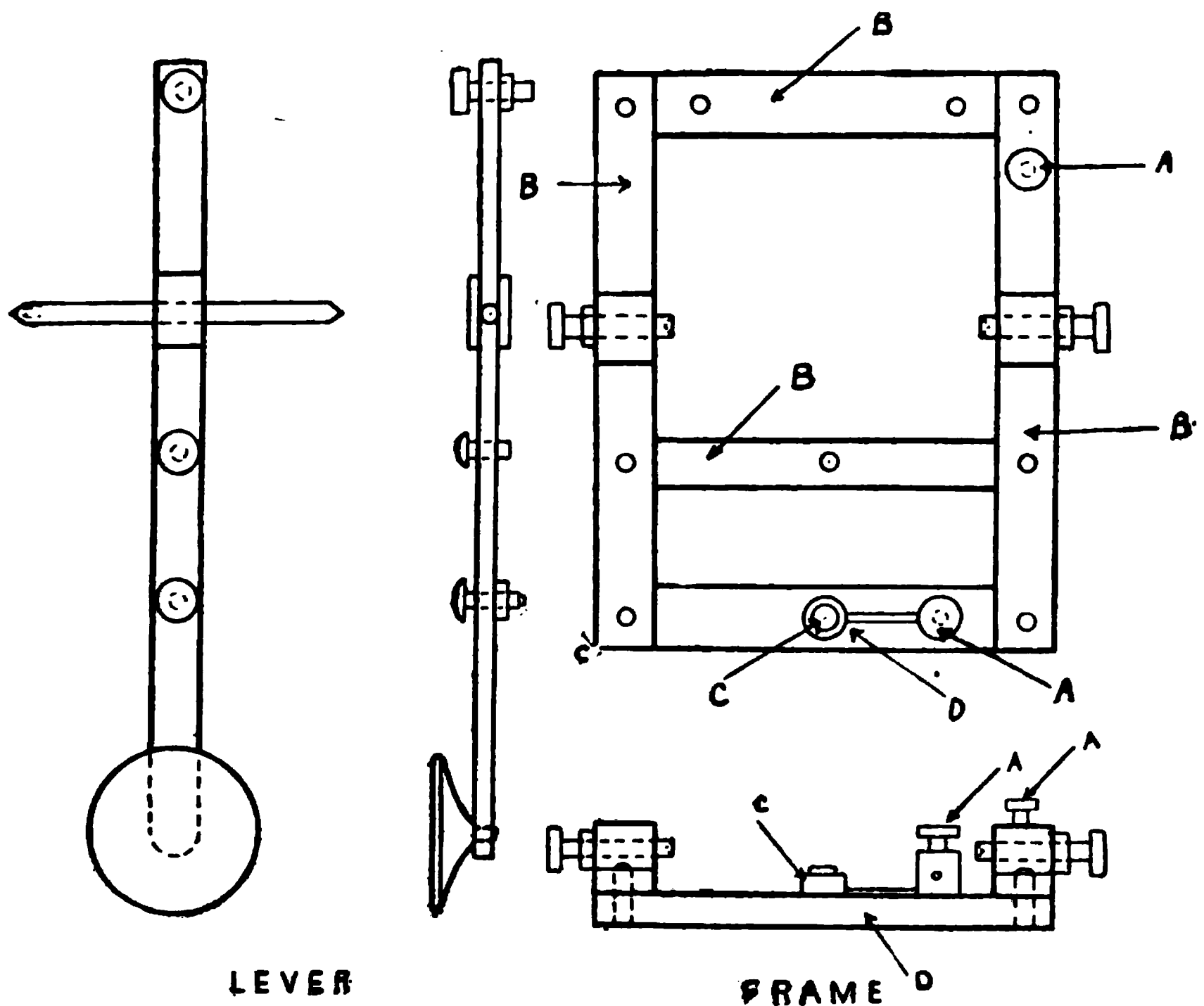


FIG. 6.—Key. A, Binding post; B, metal; C, contact; D, insulator.

operations in which the men should be trained rather better perhaps than the design in which the base and lever are shaped from a piece of metal. No dimensions are given, since the size of the key is a matter of individual judgment, though the length of the lever should be about standard. The spiral spring, which is necessary to cause the return of the key, has not been indicated, but must be made. This will involve desired practice in spring winding. No method of fastening the key to the base has been indicated. Such holes should be drilled in the strips as are necessary for this. The contact points should be of silver in order to conform to the usual practice

The sketch of the spiral inductance shown is not intended to indicate the number of turns or the size; it simply indicates in a general way one of the methods of holding this spiral on its base.

It should be easy for the instructor to have for class use similar sketches of the holder for crystal detector, a fixed condenser, a variable condenser, a fixed inductance or coil for close coupling, coils for variable coupling, multiple spark gap, switches, and other parts of simple receiving and sending sets.

Each student should be required to make simple sketches, with dimensions, of each piece that he attempts to construct. These sketches need not be carefully finished. It is probably preferable to have the work done free-hand rather than in a mechanical way.

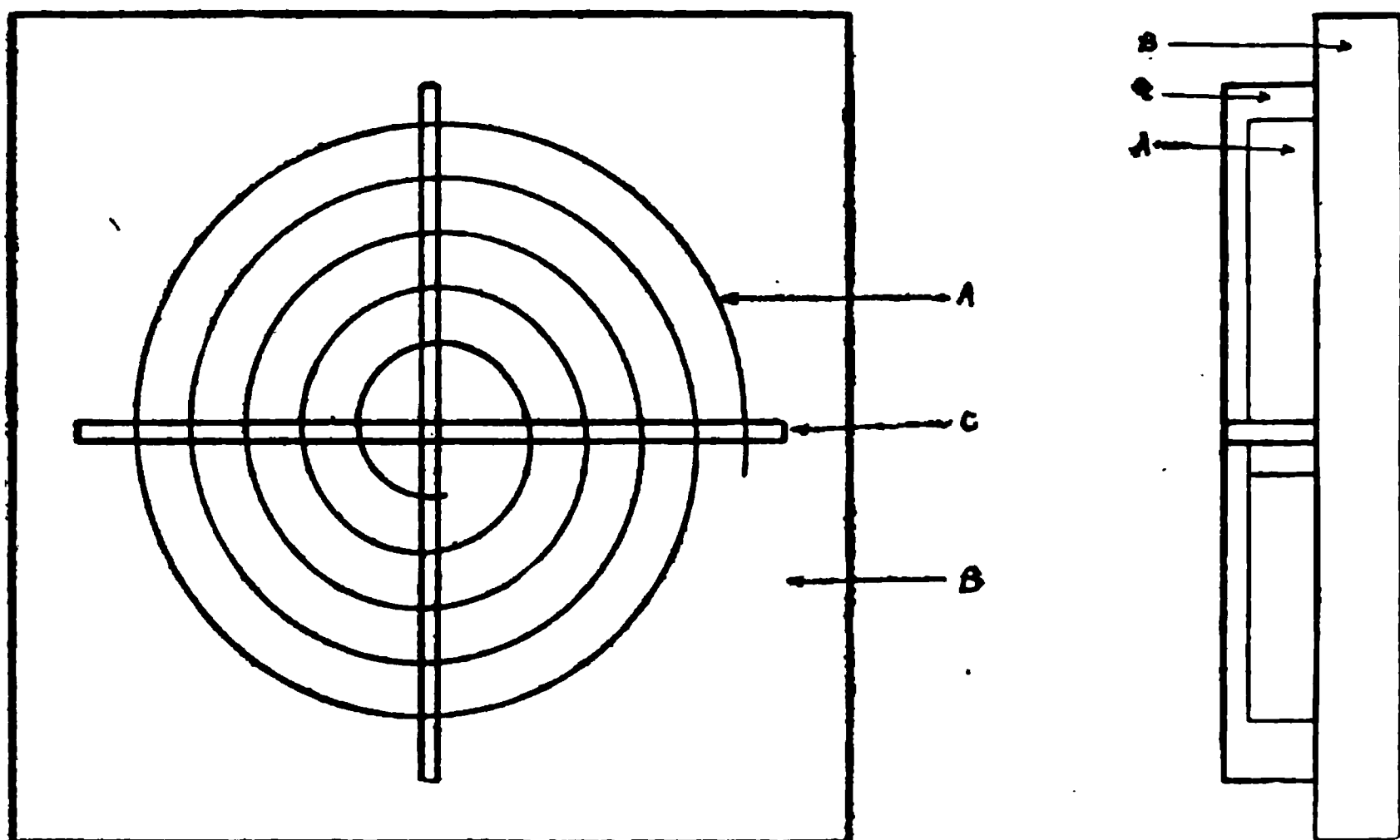


FIG. 7.—Spiral inductance. A, Sheet brass or copper; B, wood or fiber base; C, insulating holder.

All apparatus constructed in the shop should be finished. This will involve polishing of metal parts in most cases. In no case should efficiency be sacrificed to external appearance, but in work of this sort the finish is really of considerable importance. It is particularly important that, while learning to do the work, the man should learn to do a good job in finishing it up.

APPENDIX G.

Government regulation of radio.

Several textbooks give a complete statement of the law in regard to the operation of radio. This law should be consulted in detail before attempting any special work. Briefly, the following statement covers the case for radio operation in schools.

Aerials must not be used without the consent of the War Department.

Radio transmitting sets are limited to laboratory use with phantom antennas. Other equipment used in radio operation may be the same as that usually employed for such purposes. If permission is obtained to use the antennas it is limited to a single wire 100 feet long on poles 5 to 15 feet in height. It must be for temporary use only and *must not* have a sending radius exceeding 2 miles. It must be under the immediate supervision of a properly licensed individual.

It is probable that permission to erect such an aerial will not be granted to schools other than those under the immediate direction of the Army.

The energy used in the sending apparatus when an antenna is used must not exceed 50 watts.

(See Robison, pp. 232-252 for full text of laws of 1913.)

APPENDIX H.

Useful formulas.

$$I = \frac{E}{R}, \quad W = IE.$$

$$\lambda = 60,000 \sqrt{LC} \text{ (approximately).}$$

$$N = \frac{1}{\lambda}$$

I = current. E = voltage. R = resistance.

λ = wave length in meters.

v = velocity in meters.

L = inductance in millihenrys.

C = capacity in microfarads.

Z = impedance.

N = frequency (of alternating current or waves).

$$Z = \sqrt{R^2 + \left[2\pi NL - \frac{1}{2NC} \right]^2}$$

$$I = \frac{E}{Z}$$

APPENDIX I.

Sources of supply of radio apparatus.¹

Adams-Morgan Company, The, Upper Montclair, N. J.

American Radio & Research Corporation, Boston, Mass.

Brandes, C., 52 Union Square, New York City. (Head telephone sets.)

Cutting & Washington (Inc.), Cambridge, Mass.

De Forest Radio Telephone & Telegraph Co., New York City.

Duck Company, The Wm. B., Toledo, Ohio.

¹ This is not a complete list of manufacturers of radio apparatus. It has been obtained from War Department officials and War Department publications.

General Radio Company, Cambridge, Mass.

Grebe Company, The A. H., Richmond Hill, L. I., N. Y.

Haller-Cunningham Electric Company, San Francisco, Cal.

Kilbourne & Clark Mfg. Co., Seattle, Wash.

Manhattan Electrical Supply Co., New York, N. Y.

Murdock Company, Wm. J., Chelsea, Mass. (Condensers.)

Western Electric Company, New York City, Chicago, and other branches.

APPENDIX J.

Fundamental wireless circuits.

- Radio mechanics are very likely to feel during the early part of their work that their task is distinct from real radio operation.
- While this is true, each mechanic should know something about the actual connections of the wireless apparatus. In order to have easily available the simple information in regard to the "wireless circuit," the two simple diagrams below are given. These show the essentials of all wireless sets. In the sending set, there is the device for varying the wave length, the device for producing the impulse, the simple oscillating circuit, and the ground; while in the receiving set we have indicated the adjustments for variable coupling, the ground, and the detector circuit. These connections should be thoroughly understood by both radio mechanics and radio operators.

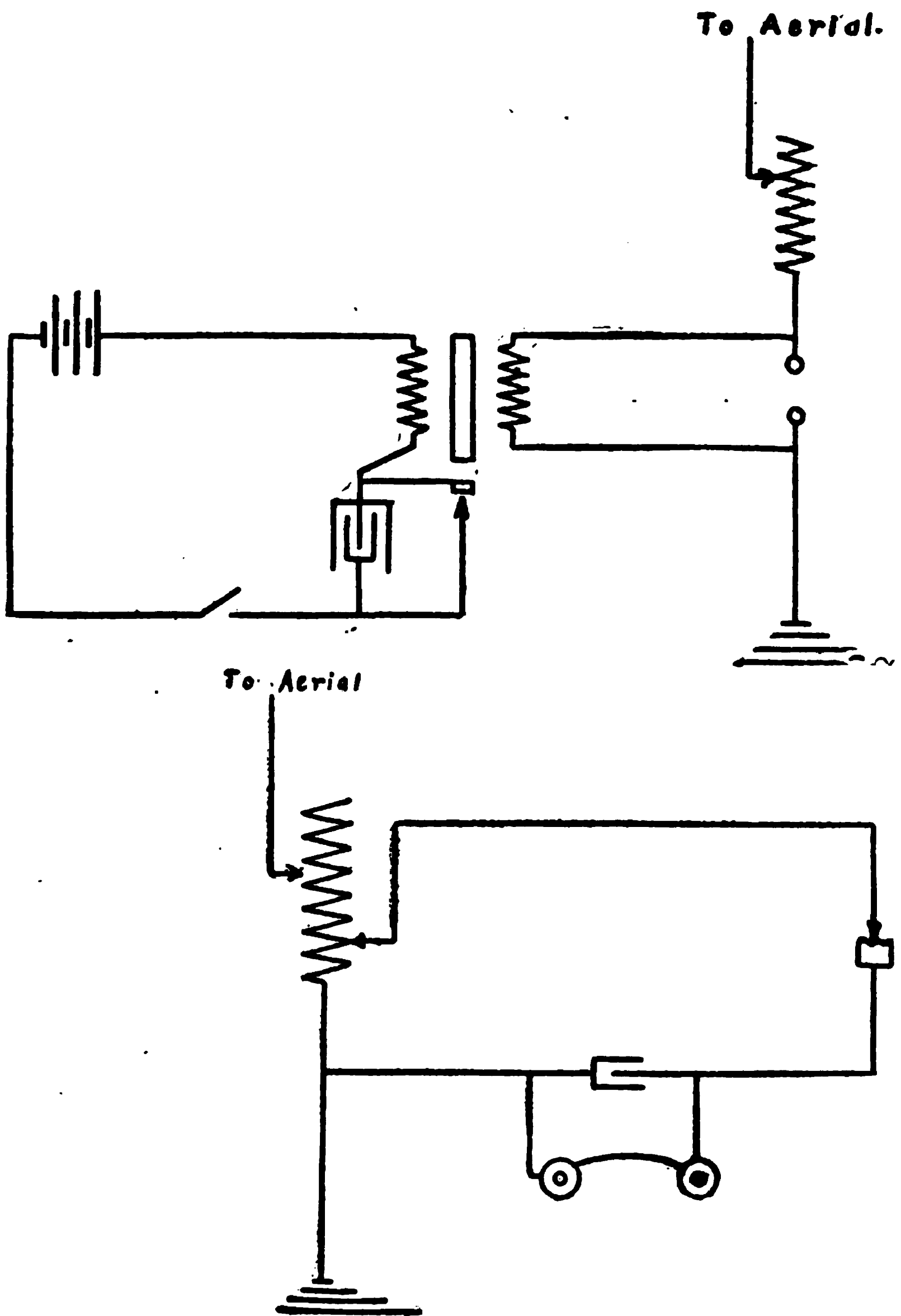


FIG. 8.—Simple sending and receiving sets.

PUBLICATIONS OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

Annual Report for 1917.

The Vocational Summary, published monthly by the Federal Board for Vocational Education (Vol. I, No. 1, May, 1918).

Bulletin No. 1. Statement of Policies.

*Bulletin No. 2. Training Conscripted Men for Service as Radio and Buzzer Operators in the United States Army (International Code).

Bulletin No. 3. Emergency Training in Shipbuilding—Evening and Part-Time Classes for Shipyard Workers.

*Bulletin No. 4. Mechanical and Technical Training for Conscripted Men (Air Division, U. S. Signal Corps).

Bulletin No. 5. Vocational Rehabilitation of Disabled Soldiers and Sailors.

Bulletin No. 6. Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors.

*Bulletin No. 7. Emergency War Training for Motor-Truck Drivers and Chauffeurs.

*Bulletin No. 8. Emergency War Training for Machine-Shop Occupations, Blacksmithing, Sheet-Metal Working, and Pipe Fitting.

*Bulletin No. 9. Emergency War Training for Electricians, Telephone Repairmen, Linemen, and Cable Splicers.

*Bulletin No. 10. Emergency War Training for Gas-Engine, Motor-Car, and Motor-Cycle Repairmen.

*Bulletin No. 11. Emergency War Training for Oxy-Acetylene Welders.

*Bulletin No. 12. Emergency War Training for Airplane Mechanics—Engine Repairmen, Woodworkers, Riggers, and Sheet-Metal Workers.

Bulletin No. 13. (Agricultural Series, No. 1.) Agricultural Education—Organization and Administration.

Bulletin No. 14. (Agricultural Series, No. 2.) Reference Material for Vocational Agricultural Instruction.

Bulletin No. 15. (Reeducational Series, No. 3.) The Evolution of National Systems of Vocational Reeducation for Disabled Soldiers and Sailors.

*Bulletin No. 16. Emergency War Training for Radio Mechanics and Radio Operators.

All communications should be addressed to

The Federal Board for Vocational Education, Washington, D. C.

* Emergency war training for conscripted and enlisted men.

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BULLETIN No. 17

**TRADE AND INDUSTRIAL
EDUCATION SERIES No. 1**

Trade and Industrial Education



Organization and Administration

**ISSUED BY THE
FEDERAL BOARD FOR VOCATIONAL EDUCATION
WASHINGTON**

OCTOBER, 1918

**WASHINGTON
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1918**

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FOREWORD.

By the provisions of the vocational education law enacted February 23, 1917, the Federal Board for Vocational Education is charged with the duty of disbursing Federal moneys to the States for approved instruction in trade and industrial lines of less than college grade, and of promoting in cooperation with the States the establishment of such instruction.

This bulletin on organization and administration is the second one to be issued along this line, the first dealing with agricultural education.

This study has been prepared by Mr. Lewis H. Carris, Assistant Director for Trade and Industrial Education, assisted by the Federal agents for trade and industrial education, more especially Mr. Harry B. Smith and Mrs. Anna L. Burdick. This bulletin is published by the Board in order to supply information and suggestion concerning the organization and administration of trade and industrial schools and classes under the Federal law. In fact, this bulletin may be considered as an official answer to the many inquiries concerning matters of policy in trade and industrial education received by the office of the Federal Board since its organization in July, 1917.

C. A. PROSSER, *Director.*

TRADE AND INDUSTRIAL EDUCATION, ORGANIZATION, AND ADMINISTRATION.

Part I. RELATING TO ALL TYPES OF TRADE AND INDUSTRIAL EDUCATION.

CHAPTER I. INTRODUCTORY.

PURPOSES OF THE BULLETIN.

The several purposes in mind in preparing the present bulletin may be briefly indicated as follows:

a. Assistance to State and local boards.—Since the Federal Board is charged with the responsibility of approving plans submitted by the States, it ought to furnish State boards with its interpretation of the Federal act, in order to assist these boards in formulating and revising their plans. Such an interpretation as regards the various types of trade and industrial education is presented in this bulletin.

The bulletin attempts further to suggest ways in which communities may establish schools and classes, and it is expected that State boards will, in preparing bulletins for distribution within the States, make free use of any and all material included herein.

A sufficiently large edition of the bulletin itself will be printed to provide States boards with copies for general distribution to local communities making inquiries concerning the provisions of the Federal act.

It is hoped that the suggestions regarding organization and administration will prove to be of practical value to State and local school authorities in setting up trade and industrial courses.

b. Assistance in teacher training.—In each State institutions have already initiated or are formulating plans for initiating training courses for teachers, and this bulletin will be available for use as a text in such courses.

c. Assistance in promoting vocational courses.—One purpose of the bulletin is to provide information of practical value to associations of employers and of employees, chambers of commerce, educational associations, and in general to any persons or associations interested in the promotion of vocational training for trades and industries.

ACCEPTANCE OF THE FEDERAL VOCATIONAL ACT BY THE STATES.

The national act providing for the promotion of vocational education, and providing an annual appropriation for use of the States,

was passed by the Sixty-fourth Congress, and approved by the President on February 23, 1917. The act established the following funds:

(1) A fund for payment of salaries of teachers, supervisors, and directors of agricultural subjects.

(2) A fund for payment of salaries of teachers of trade, home economics, and industrial subjects.

(3) A fund for maintenance of the training of teachers of agricultural, trade, home economics, and industrial subjects.

The act created a Federal Board, and provided for formal acceptance of its provisions by State legislatures, which are required to designate or create State vocational boards for administration within the State.

In the latter part of July, 1917, the President made appointments to the Federal Board for Vocational Education and the organization of this board was effected, and the staff secured about the middle of August.

Many States had already accepted the provisions of the act, and had designated a State board. In other instances, acting under the authority of the act, governors had appointed boards to administer the law until the next regular session of the legislature. As rapidly as possible the Federal Board held conferences with various State officials, prepared brief statements concerning the work, and examined plans submitted by States for the year 1917-18.

Before any State may be paid Federal money under the act in any fiscal year, the State plan for the year must be approved by the Federal Board on or before January 1. On January 1, 1918, the plan of the last State of the 48 had been approved. Every State in the Union then has had granted to it in the first year of operation a share of the Federal moneys appropriated by Congress for the promotion of vocational education. In each one of the 48 States the State board entered into a cooperative agreement with the Federal Board for the conduct of work within the State. It is realized that in this first year the work had to be undertaken without entirely adequate consideration in order that the funds might be made available as quickly as possible.

AMOUNT OF MONEY ANNUALLY AVAILABLE FOR TRADE, INDUSTRIAL, AND HOME ECONOMICS EDUCATION.

Trade or industrial schools or classes may receive benefits from the appropriation made in section 3 of the Federal act, and it is with such schools or classes only that the present bulletin deals.

Section 3 appropriates funds to be used in paying the salaries of teachers of trade, home economics, and industrial subjects for each fiscal year, making available the sum of \$500,000 for the fiscal year ended June 30, 1918, and larger sums for each subsequent year, the amount increasing annually by \$250,000 for six years, and by

\$500,000 for the seventh and the eighth years. A maximum sum of \$3,000,000, is appropriated for the fiscal year ending June 30, 1926, and for each year thereafter.

It is provided further in section 3 that the amount allotted to each State for trade, home economics, and industrial education shall be not less than \$5,000 for each fiscal year to and including the year ending June 30, 1923, and not less than \$10,000 for each fiscal year thereafter. Tables have been prepared by the Federal Board which show the sums made available each year for the entire country, and, so far as they can be determined or estimated on the basis of 1910 populations, the sums which will be available each year for each State. (See Federal Board Bulletin, No. 1.)

The annual lump sum appropriation available for salaries of trade, home economics, and industrial teachers is allotted to the States on the basis of their urban populations, to each State in the proportion which its urban population bears to the urban population of the United States exclusive of the District of Columbia. In the year ended June 30, 1918, special allotments, in addition to the sums allotted on the basis of their urban populations, were made to 24, or one-half of the 48 States, in order to provide the prescribed minimums of \$5,000.

DISTRIBUTION OF FEDERAL MONEY WITHIN THE STATES.

There will then be available annually in each State a minimum of \$5,000 or \$10,000, and in many States much larger amounts, for trade, home economics, and industrial education.

Within the States, severally, funds are to be distributed by State boards in accordance with two conditions:

(1) One-third of the appropriation must, if expended, be applied to part-time schools or classes for workers over 14 years of age who have entered upon employment. This provision is mandatory, but it does not mean that a State must spend for part-time schools or classes one-third of the fund apportioned to it for trade and industrial education. It means that one-third of this fund can not be spent for anything else than part-time instruction as described in section 11 of the act.

(2) Not more than 20 per cent of the money appropriated for trade and industrial instruction may be expended for salaries of teachers of home economics. This provision made in section 3, and section 11, also provides that a portion of the trade, home economics, and industrial fund, not exceeding 20 per cent may be used for home economics. A State may, therefore, use one-fifth of the fund for the promotion of home economics education, and although this utilization of the money is not obligatory, a large number of the States have in fact so applied portions of their allotments.

ILLUSTRATIVE BUDGETS.

Possible uses of State funds may be simply illustrated.

Assuming that a State has allotted to it for a given fiscal year the sum of \$6,000 for trade, home economics, and industrial education, in what ways can the State apply this fund?

One-fifth of it, or \$1,200, may be expended to assist in the payment of salaries of home economics teachers. Not more than \$1,200 may be so used, and any amount less may be made available by the State board for this purpose. It is to be noted that wherever any amount is expended in home economics part-time schools, that amount is to be reckoned not only as a part of the \$1,200 allowed for home economics, but also as a part of the sum expended for part-time education.

Assuming that the State expends the maximum amount available for home economics, there will be left \$4,800 for other forms of trade and industrial education. The entire \$4,800 may be spent for part-time education, this sum including the \$2,000 which must be expended, if used at all, for part-time schools.

In the case under consideration one-third of the entire sum is \$2,000. Assuming that the State sets aside \$1,200 for home economics schools, and one-third or \$2,000 for part-time schools, it would have left for other forms of trade and industrial education, namely, for day and evening schools, the sum of \$2,800, which amount it may spend entirely for evening schools, entirely for day schools, or in any proportion for day and evening schools.

It will be apparent that State boards have great latitude in budgeting the total sum available for trade, home economics, and industrial education. A few of the many ways in which \$6,000 may be budgeted are the following:

(1) Home economics.....	\$1, 200
Part-time schools.....	2, 000
Evening schools.....	1, 800
Day schools.....	1, 000
(2) Part-time schools.....	6, 000
(3) Part-time schools.....	2, 000
Evening schools.....	4, 000
(4) Home economics.....	1, 000
Part-time schools.....	2, 000
Evening schools.....	3, 000
(5) Home economics.....	1, 000
Part-time schools.....	2, 000
Day schools.....	3, 000

Budget possibilities are further illustrated in the following table:

Illustrative budgets of expenditure of a Federal grant of \$6,000 for trade, home economics, and industrial education.

Schools or classes.	Illustrative budgets. ¹						
	A.	B.	C.	D.	E.	F.	G.
Total grant for trade, home economics, and industrial education.....	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000
Total trade and industrial schools.....	5,000	5,000	4,800	6,000	4,800	4,800	6,000
All day.....		2,600				2,800	1,000
Evening.....		1,000	2,800		2,000		2,000
Part-time:							
Trade preparation.....	2,000	600			1,000	500	
Trade extension.....	3,000	600	500		1,000	1,000	3,000
General continuation.....		800		6,000	800	2,000	
Total home economics schools.....	1,000	1,000	1,200		1,200	1,200	
All day.....		500				400	
Evening.....		500			400	300	
Part-time:							
Preparation.....	500		800			200	
Extension.....	500		400		800	300	

¹ Innumerable other apportionments of \$6,000 are possible under the act. In each case, however, 33½ per cent of the fund, if expended, must be spent in part-time schools or classes, and in no case may more than 20 per cent of the fund be expended in home economics schools.

CRITICAL NEED FOR INDUSTRIAL EDUCATION.

Responsibility for training industrial workers has been rapidly shifting from the industry itself to other agencies, private or public. This shifting has been in a large measure a direct consequence of industrial development, and of generally recognized changes in industrial organization.

Conditions now obtaining generally in the industries tend to impair the value of regular apprenticeship, and in many trades no satisfactory assurance can be given to the apprentice that he will have in serving his apprenticeship opportunities for acquiring mastery in his trade.

For years before the present war the need for trade and industrial education had been apparent. With the necessity for speeding up our industries, which came even before America itself entered the war, a great demand for increased production developed. Rapid expansion in the use of machines, and induction of large numbers of workmen into the factories and shops make the need for industrial education important in time of peace, and the need becomes intensified in time of war.

The Nation can not certainly at this time afford to neglect the training of skilled workers. Since modern industrial life no longer provides opportunities for efficient training of such workers, the

obligation to give such training is rapidly devolving upon the State. Society has definite need for the services of specially trained workers in order that it may provide for its necessities and pleasures, and since the need is social the training to provide for the need should be social also.

DUTIES OF THE FEDERAL BOARD, OF STATE BOARDS, AND OF LOCAL SCHOOL BOARDS.

Widespread realization of this critical need for trained workers led to the passage of the Federal act, under which local communities may draw upon the resources of three cooperating agencies. For each of these agencies, namely, the Federal Board, the State boards, and the local school boards, separate and distinct responsibilities, duties, and privileges are prescribed.

Upon the Federal Board the duty is imposed by the National act of cooperating with State boards, and of ascertaining annually whether the States are using or are prepared to use in compliance with the law the funds available for vocational education. The Federal Board is charged further with the responsibility of interpreting the provisions of the act, so that the funds may be used effectively. In carrying out these responsibilities, the board is bound to assist State and local authorities with every possible suggestion of ways and means of effective expenditure of the Federal funds supplemented by State and local funds.

The State board is charged by the Federal act with the responsibility of preparing State plans—setting forth with other data (see appendix) the kinds of schools to be aided, their equipment, their courses of study, and the qualifications of their teachers—for approval by the Federal Board. It is charged further with the responsibility of supervising schools organized within the State; with the responsibility of distributing Federal funds apportioned to the State among the several communities where schools or classes have been organized in accordance with the terms of the law; and generally with the responsibility of promoting vocational education within the State, and of disseminating information concerning desirable forms of vocational education. Acting in cooperation with the Federal Board, the State board is a joint trustee of funds allotted to a State for specific purposes.

The local board of education functions relatively to the State board, in a way similar in many respects to that in which the State board functions relatively to the Federal Board. The local board must provide the local funds necessary to maintain any schools or classes which it may organize in accordance with the terms of a State plan. It is usually charged with the responsibility of hiring the teachers, of securing the pupils, and of conducting the scheduled sessions of the school.

The three cooperating agencies must act in agreement and with unified aims and purposes to the end that the funds provided shall be wisely expended, so as to meet in the best possible way the critical need for trade and industrial education.

GENERAL EDUCATION AND VOCATIONAL EDUCATION.

It may be well to emphasize at this point that the Federal funds are appropriated for the very specific purpose of providing vocational education, and that vocational education is intended for persons who have chosen or have entered upon a particular employment. Since the administration of vocational education usually rests in the hands of persons charged also with responsibility for the organization and conduct of schools giving general education, confusion often results between the two kinds of educational activities—general and vocational.

General education, properly directed and controlled, aims to improve general intelligence. Vocational education, on the other hand, aims to make an intelligent producer, either of commodities or of services. The aims of elementary and high schools include many motives which are not germane to vocational training.

Many high schools have as a definite aim the preparation for entrance to higher institutions of a large number of pupils who are at least potential candidates for entrance into such institutions. Education and training of this character does not primarily concern itself, as does vocational education, with the preparation of youth for immediate self-support in a determined-upon occupation.

In a sense it is true that all education, provided the educative process is well planned and well executed, is preparation for citizenship and for vocational activities, but it should be clear that the dominant aims of a person or group of persons at any given time should determine the content and the method of the appropriate educational process.

When an individual starts upon his life work, either by definite preparation for a particular vocation or by actual participation in the work of that vocation, his interest in studies possessing exclusively a general or interpretative value is eclipsed by the immediate focusing of his attention and by the concentration of his efforts upon vocational interests.

Except in the case of a few professions, such as law, theology, and medicine, until comparatively recent times, men have learned vocations by entering upon them. During the last century, however, there has been a rapid growth of vocational schools of many kinds, such as normal schools, dental colleges, pharmaceutical schools, training schools for nurses, engineering schools, agricultural colleges, and business schools. As society has developed needs for the services of

persons trained in special vocations, schools, either private or public, have been established to prepare persons who have chosen for a life work service in particular vocational fields. Vocational schools have **not** been organized, however, until the vocations themselves have developed a content, technique, or method to such an extent that adequate preparation could no longer be given by apprenticeship or shop-training methods.

It must be assumed as axiomatic that vocational education is intended and provided for individuals who have made definite vocational choices, and for such individuals only.

A clear understanding that this determination of aim is an essential prerequisite to effective vocational training of an individual would clear up much confusion which now exists as a result of the use of the term "vocational" to describe certain subjects of study in the general elementary or secondary school, such as manual training or mechanical drawing and shop work, which are pursued by those who probably have not yet selected a vocation. While the educational value of these and other "practical" subjects is not questioned, there rests clearly upon the school and the community an obligation to set up adequate means to help the pupil and his parents to determine wisely upon specific vocational preparation.

TYPES OF VOCATIONAL CLASSES.

Vocational education is for two distinct groups of students. Boys and girls enrolled in public schools who are preparing to enter a particular occupation may be given instruction in all-day vocational schools; and workers who have already entered upon employment may be given vocational training in part-time and evening schools.

As regards day vocational schools, while the number of persons who can undertake long periods of training in day schools as a preparation for entering upon industrial employment may be comparatively small, the measure of the value of day vocational schools can not be found in the number of pupils they serve. It is found rather in the importance of the service rendered. When organized, planned, and administered so as to give work which will in part take the place of the former apprenticeship training, the day schools should prepare persons for leadership in the skilled trades and vocations. They should also become centers for the standardization of the trade taught. There are limitations to the possibilities for day school work, however, which should be frankly discussed.

Most persons, it may be noted, enter upon employment without making a definite choice of a life work, and these are, therefore, not definitely candidates for any specific course of day-school training. Moreover, relatively few trades or industries have enough content to make up an extended course of study for a day vocational school;

and, finally, the per capita cost in a separate day vocational school is high—usually much higher than it is in secondary schools giving general education.

A community should give careful consideration to these limitations in determining what kind of vocational schools it should establish.

The public cosmopolitan high school can, under favorable conditions, undertake courses of one to four years, provided a separate department for the vocational courses is created, and provided such courses are supported by a sufficiently broad conception of community needs on the part of those charged with this sort of secondary education. Such a high school will assume its full responsibility if the vocational courses meet two sorts of community needs; first, those of the youth in that community who will seek employment before or at completion of the high school course, and, secondly, those of the industries of that community for greater efficiency in their labor force.

The ways in which a community should determine what kind of vocational schools it should have, if any, will be pointed out later. The Federal Board believes that the most careful consideration should be given to this matter before a final decision is made to establish a day trade or industrial schools.

Schools for workers are of two types. First, those for persons who are employed under such conditions that they can give a part of the regular hours of employment to educational work, and, secondly, those for persons who must secure their further education, if at all, outside regular working hours. The former are part-time schools, the latter evening schools.

NEED FOR PART-TIME EDUCATION.

The distribution of the total school enrollment of the country emphasizes the fact that great numbers of boys and girls quit school during the upper grades of the elementary school. The Report of the Commissioner of Education, 1917 (p. 7) shows that the total school enrollment of 1915 was 21,958,836, distributed as follows:

	Per cent.
In elementary schools.....	91.03
In high schools, academies, and secondary schools.....	7.13
In higher institutions.....	1.84

It is estimated for the year 1915 that more than two-fifths (42.3 per cent) of the youth of the country between 15 and 17 years of age were not in school. The attendance begins a precipitate decline at the end of the fifth grade, and at the age of 14 years. According to the Federal census in 1910, the percentage of boys not in school

increased from 11.7, or about one-ninth, in the age 13 years to 66, or two-thirds, for the age 17 years, the corresponding percentages for girls being 10.7 and 63.4.

Approximately 2,000,000 children arrive at a given age annually. One-half of the children of 16 years and under 17, have left school either in that year of age or at some younger age. Of those 17 and under 18 years, as noted above, two-thirds have left school, and of those 18 and under 19; that is to say of those classified in the census as 18 years of age, more than three-fourths have left school. Of all boys 14 and 15 years of age, i e., between the exact ages 14 and 16 years, 41.4 per cent, or two-fifths, and of all girls in these ages 19.8 per cent or one-fifth are in gainful employments. (Federal census, 1910, Vol. IV, p. 69.) The number gainfully employed in the ages 14 and 15 years may be estimated for 1918 as being approximately 800,000 boys and 400,000 girls.

Because of the large numbers of children who leave school at an early age, without opportunity for choice of an occupation or an adequate understanding of the need of preparation for it, and because these same boys and girls drift into uneducative and unprogressive jobs, it is imperative that the public school extend its responsibilities to meet the needs of these youths who have already entered employment by establishing part-time schools and classes.

CHAPTER II.

STATE PLANS.

INITIAL STEPS IN SETTING UP A PROGRAM.

Three steps are necessary to put a program for trade or industrial education into operation in any State: First, acceptance of the Federal act by the State; second, adoption of a plan by the State board designated in the State's act of acceptance; and thirdly, approval of the plan by the Federal Board. This section of the bulletin deals entirely with the State plan.

WHAT A STATE PLAN IS.

(a) A State plan is an agreement between the representatives of two cooperating agencies engaged in the promotion and conduct of vocational education; namely, the Federal Government and the State, represented respectively by the Federal Board for Vocational Education and the State Board for Vocational Education.

The plan for a State should show the complete scheme for administration of the act in the State, covering such subjects as: Acceptance of the act, giving full details as to the State board designated; plans for administration of the act and for supervision of schools established under it; and description in full of each kind of vocational education which the State is conducting or expects to conduct.

(b) A State plan is individual. As joint trustee with the Federal Board for the expenditure of Federal funds, the State board is charged with the responsibility of using the national moneys available for the joint interests of the State and Federal Governments in the promotion of vocational education. This money can be expended wisely only when the special industrial needs of a particular State are given careful consideration. The States vary widely as to the resources available for education of any kind; they vary as to the development of industrial education; they vary as to the development of general education. The needs of Massachusetts differ widely from the needs of Mississippi; the industrial development of California differs widely in extent and character from that of Florida. New York contains a large number of cities of over 25,000 population, while New Mexico has very few. All differences such as these and many others must be taken into account by a State board in preparing and adopting a plan for trade and industrial education. Each State plan will therefore be essentially individual in character.

(c) A State plan is generally provisional and subject to frequent revision. Few of the States prior to the passage of the Federal act had adopted plans providing any State scheme for vocational education, and consequently until after considerable experience has been gained, any plan proposed must be more or less in the nature of an experiment. It should be, however, in the nature of a purposeful experiment and the conditions under which the experiment is conducted must be such as to give as favorable a result as possible. It is probable that for sometime to come many changes will be necessary each year in each State plan. As a matter of fact the Federal Board does not expect that a State plan adopted for a year will necessarily be followed for the entire year, since conditions may arise at any time which will necessitate changes. It does require, however, that any proposed changes during the year shall have its approval before they can be incorporated as a part of the State scheme.

FUNDAMENTAL CONDITIONS AND PRINCIPLES TO BE OBSERVED.

It will be apparent from the foregoing characterization of the State plan, that certain fundamental conditions and principles of policy must be kept in mind by the State board and by the Federal Board, in adopting and approving a plan. This may be briefly summarized as follows:

1. The plan is an agreement between the State board and the Federal Board.
2. There are certain absolute conditions and standards found in the Federal act which must be made a part of the State plan.
3. The State board must make its own interpretation of certain other conditions and standards found in the Federal act.
4. The Federal Board does not expect uniformity in plans except in so far as absolute standards and conditions are set up in the act.
5. The Federal Board expects that State plans will be prepared with reference to local or State needs.
6. A State plan is adopted and approved for one year only.
7. A State plan can not be expected to be prepared in final form since vocational education has not been systematically organized and carried out in many States.
8. The Federal Board welcomes initiative and purposeful experimentation and wishes the plans to show this.
9. The Federal Board welcomes changes in State plans even within the year.
10. When a State plan has been approved by the Federal Board the State board can go ahead with assurance in the establishment of schools and classes.

PROCEDURE IN APPROVING STATE PLANS FOR 1917-18.

The State plans for 1917-18 were prepared by State boards and approved by the Federal Board under unusual conditions.

It was late in August before the Federal Board had completed its organization, by the selection of a staff, hence it was absolutely impossible to announce any principles and policies which could be put into effect at the beginning of the year 1917-18.

A large number of States were without experience in the administration of vocational education. Several of the States had not yet accepted the provisions of the Federal act.

State boards made an immediate demand upon the Federal Board for information concerning the nature and content of work required, the kinds of schools that would be authorized, and the sort of State plan that would be approved.

Under the conditions the Federal Board could not hope to see a large development of industrial education in all of the States during the school year 1917-18. Many of the State boards had not yet selected an executive officer, and many of the States were without funds for the administration of the act. As a result of the above conditions, the Federal Board approved plans which it realized would of necessity be revised in the light of growing experience.

It approved plans which were prepared by State boards with the direct help of members of the board's staff. It approved plans before a careful study could be made of all the needs of the State where the plan was to be put into operation. It approved plans which did not give entirely adequate statements concerning certain features required by the law to be a part of State plans. In certain instances it approved plans before the organization of an executive staff in the State to carry out the provisions of the plan.

To meet general conditions the board prepared certain memoranda, known as Memos A, B, C, and D, which it required to be incorporated as a part of every plan.

The sole aim of the Federal Board was to enable each of the States to use the funds allotted to it during the year 1917-18, making certain only that the funds should be expended in accordance with the law. The plans resulting from this hasty but necessary action were surprisingly good and have given the States a starting point from which to make progress in building up plans which shall be adequate, shall reflect the needs of the States for vocational education, and shall give as great a latitude as is legally possible to the communities within the States to inaugurate acceptable schools and classes.

CONDITIONS OF GOOD STATE PLANNING.

The Federal Board wishes to give all the assistance possible to State boards in revising their plans for the year 1918-19. It must, however, point out that the primary responsibility rests with the State board, and no State board can hope to prepare and execute a plan which will really be representative of the industrial needs of the State, unless it has an administrative staff which can give time and attention not only to the supervision of the schools when established, but also to the preparation of policies which it may recommend to the State board for incorporation into its plan.

The State plans should be prepared in the light of a continuous industrial survey; and the plan for each year should be adapted to such needs as a cross section of this survey reveal at the beginning of that year, taking into account the financial resources of the State, available for support of adequate provisions to meet the needs wholly or in part.

It is not expected that all States can attempt a formal survey such as has been made in a few States and communities, but every State board can add to its information from time to time additional knowledge of its industries and of the needs of its industrial workers.

In order to make a satisfactory plan, much study and attention are required. The States which can provide the most satisfactory plans are those which have available executives who can give the necessary time and attention to the States' needs—not as represented in the needs of schools already established—but rather as represented in the opportunities for future establishment of schools under the State plan.

The Federal Board prepared a suggestive outline which was followed by most of the States in proposing their initial plans. A revision of this outline for State plans, which State boards are asked to follow in 1918-19, is given in the appendix.

CHAPTER III.

CONDITIONS AND STANDARDS.

THESE TERMS NOT DIFFERENTIATED.

There are certain statutory provisions in accordance with which the schools and classes in trade and industrial education must be organized in order to receive Federal aid. In order that there may be some method of judging whether a school meets these provisions this section of the bulletin attempts to catalogue somewhat in detail the standards and conditions as they are stated in the Federal act.

No attempt has been made to differentiate between standards and conditions, because the condition itself may become the standard of judgment. It is, in fact, in some cases difficult to determine whether a provision or requirement is a condition or a standard.

The act provides that these standards and conditions must be inserted by State boards in the plans which they submit to the Federal Board for approval. For certain features of State plans these standards are fixed or absolute; for example, the minimum requirement that part-time schools or classes must be in session at least 144 hours a year is an absolute standard. The statement that the State board shall prepare plans showing course of study, which plan shall be approved by the Federal Board, may be called a discretionary standard, in that the Federal Board must determine what shall be to it an acceptable course of study, which when submitted by a State will be approved.

LEGAL PROVISIONS RELATIVE TO DIFFERENT TYPES OF SCHOOLS OR CLASSES.

This bulletin is largely concerned with an explanation and an interpretation of the conditions and standards concerning trade or industrial education which are found in the Federal act. These are given below in the terms of the law and without comment. (References are to the act as printed in Bulletin No. 1).

A. Applying to all schools and classes:

1. Public supervision or control. "Such education shall be given in schools or classes under public supervision or control." (Sec. 11, lines 4 and 5.)

A. Applying to all schools and classes—Continued.

2. Instruction must be of less than college grade. "That such education shall be of less than college grade." (Sec. 11, lines 6 and 7.)
3. For pupils over 14 years of age. "Such instruction shall be designed to meet the needs of persons over 14 years of age who are preparing for a trade or industrial pursuit or who have entered upon the work of a trade or industrial pursuit." (Sec. 11, lines 7 to 10.)
4. Federal funds must be matched by State or local funds or both. "The moneys expended * * * for the salaries of teachers of trade * * * and industrial subjects shall be conditioned that for each dollar of Federal money expended for such salaries the State or local community, or both, shall expend an equal amount for such salaries." (Sec. 9, lines 10 to 16.)
5. Federal funds must be expended for salaries only. "That for the purpose of cooperating with the States in paying the salaries of teachers of trade * * * and industrial subjects there is hereby appropriated * * * " (Sec. 3, lines 1 to 3.)

B. Applying to all schools and classes giving industrial education but needing interpretation for each kind, i. e., all-day, evening, and part-time.

1. Controlling purpose. "* * * the controlling purpose of such education shall be to fit for useful employment." (Sec. 11, lines 5 and 6.)
2. Plant and equipment. "The State board shall prepare plans showing * * * the kinds of * * * equipment." (Sec. 8, lines 2-4.)
"The State or local community, or both, shall provide the necessary plant and equipment determined upon by the State board, with the approval of the Federal Board for Vocational Education, as the minimum requirement in each State for education in any given trade or industrial pursuit * * *." (Sec. 11, lines 9-13.)
3. Minimum amount to be expended for maintenance. "That the total amount expended for the maintenance of such education in any school or class receiving the benefit of such appropriation shall be not less annually than the amount fixed by the State board, with the approval of the Federal board, as the minimum for such schools and classes in the State * * *." (Sec. 11, lines 13-17.)
4. Courses of study.
"The State board shall prepare plans showing * * * course of study * * *." (Sec. 8, lines 2-4.)
5. Methods of instruction.
"The State board shall prepare plans showing * * * methods of instruction * * *."
6. Qualifications of teachers.
"That the teachers of any trade or industrial subject in any State shall have at least the minimum qualification for teachers of such subjects determined upon for such State by the State board, with the approval of the Federal Board for Vocational Education." (Sec. 11, lines 31-35.)
"* * * That the State board, with the approval of the Federal Board, shall establish minimum requirements for such (adequate vocational) experience or contact * * * teachers of trade, (and) industrial * * * subjects." (Sec. 12, lines 10-14.)
"The State board shall prepare plans showing * * * qualifications of teachers * * *." (Sec. 8, lines 2-5.)

B. Applying to all schools and classes, etc.—Continued.**7. Kinds of schools.**

"The State board shall prepare plans showing * * * the kinds of schools * * *." (Sec. 8, lines 2-4.)

C. Applying to all-day schools only.**1. In all cities and towns.****(a) Age of admission.**

"That such education * * * shall be designed to meet the needs of persons over 14 years of age * * *." (Sec. 11, lines 6-8.)

(b) Half time to practical work.

"That such schools or classes giving instruction to persons who have not entered upon employment shall require that at least half of the time of such instruction be given to practical work on a useful or productive basis. (Sec. 11, lines 17-20.)

2. In towns and cities of more than 25,000 population.**(a) Length of term.****(b) Number of hours per week.****3. In towns and cities of less than 25,000 population.****(a) Length of term.**

"* * * The State board, with the approval of the Federal Board, may modify the conditions as to the length of course * * * for schools and classes giving instructions to those who have not entered upon employment, in order to meet the particular needs. * * *." (Sec. 11, lines 36-40.)

(b) Hours of instruction.

"* * * The State board, with the approval of the Federal Board, may modify the conditions as to the * * * hours of instruction per week for schools and classes giving instruction to those who have not entered upon employment, in order to meet the particular needs of * * *." (Sec. 11, lines 36-40.)

D. Applying to part-time schools and classes only.**1. Division of fund.**

"* * * At least one-third of the sum appropriated to any State for the salaries of teachers of trade, home economics, and industrial subjects shall, if expended, be applied to part-time classes." (Sec. 11, lines 21-24.)

2. Pupils must have entered employment.

"* * * Such education shall be designed to meet the needs of persons * * * who have entered upon the work of a trade or industrial pursuit." (Sec. 11, lines 6-9.)

"* * * that at least one-third of the sum appropriated to any State for the salaries of teachers of trade, home economics, and industrial subjects shall, if expended, be applied to part-time schools or classes for workers * * * who have entered upon employment * * * ." (Sec. 11, lines 21-25.)

3. Entrance age.

"That such education * * * shall be designed to meet the needs of persons over 14 years of age * * * who have entered upon the work of a trade or industrial pursuit." (Sec. 11, lines 6-9.)

"* * * that at least one-third of the sum appropriated to any State for the salaries of teachers of trade, home economics, and industrial subjects shall, if expended, be applied to part-time schools or classes for workers over 14 years of age." (Sec. 11, lines 21-24.)

D. Applying to part-time schools and classes only—Continued.**4. Provisions for trade extension part-time classes.**

"The controlling purpose shall be to fit for useful employment."
(Sec. 11, lines 5 and 6.)

"Such education shall be designed to meet the needs of persons * * * who have entered upon the work of a trade or industrial pursuit." (Sec. 11, lines 6-9.)

5. Provisions for trade preparatory part-time schools or classes.

"* * * such education shall be designed to meet the needs of persons * * * who are preparing for a trade or industrial pursuit." (Sec. 11, lines 6-8.)

"* * * That at least one-third of the sum appropriated to any State * * * shall, if expended, be applied to part-time schools and classes who have entered upon employment." (Sec. 11, lines 21-25.)

6. Provision for general continuation part-time schools or classes.

"* * * such subjects in a part-time school or class may mean any subject given to enlarge the civic or vocational intelligence of such workers * * *." (Sec. 11, lines 25-27.)

7. Provision as to minimum length of course.

"* * * such part-time schools or classes shall provide for not less than 144 hours of class-room instruction per year." (Sec. 11, lines 27-29.)

E. Applying to evening schools only.**1. Entrance age.**

"* * * Evening industrial schools shall fix the age of 16 years as a minimum entrance requirement." (Sec. 11, lines 29 and 30.)

2. Character of instruction.

"* * * Evening industrial schools * * * shall confine instruction to that which is supplemental to the daily employment." (Sec. 11, lines 29-31.)

CHAPTER IV.

TYPES OF SCHOOLS.

TYPES AUTHORIZED.

Under the Federal act, as appears from the foregoing chapter, six types of trade or industrial schools or classes may be organized; namely, the following:

- A. Unit trade.
- B. General industrial in cities under 25,000.
- C. Part-time trade extension.
- D. Part-time trade preparatory.
- E. Part-time general continuation.
- F. Evening industrial.

What follows in the several sections of this chapter is partly definition and partly description of these types of schools and classes. The statements made being based entirely upon sections 8 and 11 of the act, in which the authority for all statements may be found.

LEGAL PROVISIONS APPLYING TO ALL TYPES.

Schools or classes of each type specified above must fulfill certain requirements, which may be enumerated as applying generally to all forms of Federally aided trade, industrial, and home economics instruction.

In the case of each school or class established under the Federal act, (a) it must be established and maintained under public supervision and control; (b) it must provide instruction of less than college grade; and (c) it must be conducted in accordance with a plan adopted by the State board for vocational education and approved by the Federal Board, which plan must show the necessary plant and equipment, the minimum annual maintenance, the courses of study, the approved methods of instruction, and the qualifications of teachers, including adequate vocational experience or contact.

For convenience these requirements or conditions of all types of schools or classes may be listed as follows:

1. Public supervision and control.
2. Instruction of less than college grade.
3. Compliance with approved State plan, as regards:
 - (a) Plant and equipment.
 - (b) Minimum annual maintenance.
 - (c) Courses of study.
 - (d) Methods of instruction.
 - (e) Qualifications of teachers.

For an outline showing in detail the scope of State plans see Appendix, page 6.

A. UNIT TRADE SCHOOLS OR CLASSES.

A unit trade school or class established under the Federal act is a public school or class established and maintained in any community for the purpose of fitting persons for useful employment in a particular trade or industrial pursuit through instruction of less than college grade (*a*) designed to meet the needs of persons over 14 years of age; (*b*) giving not less than half of the time to practical work on a useful or productive basis; and (*c*) extending over not less than 9 months, (36 weeks) per year, and not less than 30 (clock) hours per week.

(Full compliance with an adopted and approved State plan is also required. See section above on "Legal provisions applying to all types.")

When a group of young men over 14 years of age not yet employed attend an all day school or class for the purpose of preparing for entrance into the plumbers' trade, and when the instruction given them both shop and related class work is based solely upon the plumbers' trade needs, this constitutes a unit trade school or class.

B. GENERAL INDUSTRIAL SCHOOLS OR CLASSES.

A general industrial school or class established under the Federal act is a public school or class established and maintained in any city or town of less than 25,000 population for the purpose of fitting persons for useful employment in trade or industry through instruction of less than college grade (*a*) designed to meet the needs of persons over 14 years of age; and (*b*) giving not less than half the time to practical work on a useful or productive basis. The general industrial school is designed to meet the particular needs of cities or towns of less than 25,000 population. (Full compliance with an adopted and approved State plan is also required. See section above on "Legal requirements applying to all types.")

If the group of boys preparing in our unit trade school had been a very small group living in a town of less than 25,000 inhabitants, it would perhaps have been impossible to provide them with a special shop and a special teacher for instruction in plumbing only.

In this case boys from other building trade groups, such as, for example, carpentry, brick laying, and plastering, might have been added to our original class, so as to form a class in the building trades rather than in any one (unit) trade.

Such a class would receive shop instruction as nearly like that of a unit trade school as possible under the conditions, and would receive instruction in related work underlying the building trades as a group—in, for instance, mathematics, estimating, structural and elementary architectural drawing, and building ordinances and regulations. This would be a general industrial school or class.

C. PART-TIME TRADE EXTENSION SCHOOLS OR CLASSES.

A trade extension part-time school or class established under the Federal act is a public school or class established and maintained in any community for the purpose of giving instruction of less than college grade to persons over 14 years of age who have entered upon the work of a trade or industrial pursuit, which instruction shall further fit persons taking it for useful employment in the trade or industrial pursuit in which they are employed. The instruction in a trade extension part-time school or class must (a) meet the needs of persons over 14 years of age; and must be given for not less than 144 hours per year. (Full compliance with an adopted and approved State plan is also required. See section above on "Legal provisions applying to all types.")

Thus, the plumber's apprentice before mentioned might be given the identical instruction set forth for the evening class and such instruction constitute part-time work, but only in case it is given between the hours of 8 a. m. and 5 p. m., which are assumed to be the limits of the plumber's working day. Instruction not supplementary to the plumber's trade, such as instruction in English or industrial history could not be given in this class. Such subjects would be permitted only in the general continuation school described below.

D. PART-TIME TRADE PREPARATORY SCHOOLS OR CLASSES.

A trade preparatory part-time school or class established under the Federal act is a public school or class established and maintained in any community for the purpose of giving instruction of less than college grade to persons over 14 years of age who have entered upon employment, which instruction shall be designed to fit these persons for useful employment in a trade or industrial pursuit other than the one in which they are employed. The instruction in a trade-preparatory part-time school or class must (a) meet the needs of persons over 14 years of age; and (b) must be given for not less than 144 hours per year. (Full compliance with an adopted and approved State plan is also required. See section above on "Legal provisions applying to all types.")

The work already mentioned in two examples of plumber's part-time instruction might, if elementary enough, be given between 8 a. m. and 5 p. m. to a group of pupils employed as messengers, clerks, soda-fountain men, drivers, and in other occupations, excepting plumbing, the instruction being devised to prepare for entrance into the plumbing trade. Such a class would be a part-time trade preparatory class. Its work would seldom, if ever, coincide with that of the trade-extension class, and the success of such instruction, except as an entering wedge to be followed later by part-time trade extension work, is generally doubtful.

E. PART-TIME GENERAL CONTINUATION SCHOOLS OR CLASSES.

A general continuation part-time school or class established under the Federal act is a public school or class established and maintained in any community for the purpose of giving instruction of less than college grade to persons over 14 who have entered upon employment, which instruction shall be given in subjects to enlarge the civic or vocational intelligence of young workers. The instruction in a general continuation part-time school or class must (a) be designed to meet the needs of persons over 14 and less than 18 years of age; (b) be given for less than 144 hours per year.

(Full compliance with an adopted and approved State plan is also required. See section above on "Legal provisions applying to all types.")

The group of plumbers in our trade extension class, and the mixed group from various occupations in our example of trade preparatory work might, if they were all over 14 years of age, be grouped together in classes where instruction would be given in such subjects as English, civics, history of industries, arithmetic, trade mathematics, or any commercial branch or elementary school subject. Such a class would be a general continuation part-time class if it met between 8 a. m. and 5 p. m. where these hours constitute the working day.

To similar classes might come young women from stores or factories to study home economics subjects, commercial subjects, industrial subjects not trade extension or preparatory, and general educational courses.

F. EVENING INDUSTRIAL SCHOOLS OR CLASSES.

An evening industrial school or class established under the Federal act is a public school or class established and maintained in any community for the purpose of giving instruction of less than college grade in a particular trade, supplemental to the day employment, to persons over 16 years of age who have entered upon employment in that trade or industrial pursuit.

(Full compliance with an adopted and approved State plan is also required. See section above on "Legal provisions applying to all types.")

For example, an evening industrial school for plumbers' helpers would be established to give these boys instruction in blue-print reading for plumbers; in State and local rules and regulations for plumbing installation; in costs and estimating; and in other allied subjects, all related to the plumbing trade. The instruction would be of less than college grade and given outside the hours of 8 a. m. to 5 p. m., if these hours constituted the regular working day for plumbers in that community.

CHAPTER V.

FIXED STANDARDS APPLYING TO ALL TYPES OF SCHOOLS.

PUBLIC SUPERVISION OR CONTROL.

Schools or classes established under the act must all be under public supervision or control. In defining public supervision, it must be remembered that since section 17 of the act forbids the use of Federal funds in any privately owned or conducted institution, this statement in section 11 can mean only public institutions under public supervision, which in reality is equal to requiring public control—that is to say, “control in the hands of an officer or board selected by the people or appointed by another officer or board so selected.” (Bulletin No. 1, p. 25.)

It is evident, therefore, that to quote further from the statement of policies, “the guiding principle of the vocational education act—and it can not be too strongly emphasized that this principle applies to every phase of activity under the act—is that the education to be furnished must be under public supervision and control, and designated to train persons for useful employment whether in agriculture, trade and industry, or home economics.” (Bulletin 1, p. 9.)

It is evident, further, that the provision of the act fixing the standard of public supervision or control was intended to exclude from the benefits of participation in the Federal funds all privately owned or conducted schools or classes, or publicly chartered schools under the control of a self-perpetuating board of trustees or a board of trustees selected in any other way than by the people, either directly or indirectly.

Under this act, then, public schools in country districts, towns and cities, and State schools, and classes held in any of the schools, when controlled by trustees elected by the people, and when supervised by the proper public officials, are entitled to Federal aid, so far as being under public supervision and control is concerned. Moreover, classes maintained by these public trustees, supervised and controlled by them or their appointees, taught by instructors paid from public funds, and supervised by public officials may be conducted in private schools or plants and federally aided, provided the private school officials have neither supervision nor control over classes, and provided no part of the Federal moneys is paid either directly or indirectly to the support of such school or plant.

Except for classes such as those indicated above, private schools and academies whether or not used as the public school of the community by paying tuition from public funds, parochial schools, sectarian schools of all kinds, and privately endowed colleges whatever their educational standing are barred from receiving Federal aid, even though some portion of their trustees may be elected by public ballot or be appointed by officials so elected.

INSTRUCTION OF LESS THAN COLLEGE GRADE.

Besides being publicly supervised and controlled, the instruction in a school or class established under the act must be of less than college grade, and the State board must require that each school or class be defined as doing work of less than college grade if this work is to be aided under the act.

If a school or class is maintained even in part by Federal moneys granted to the institution as of college grade, the work will not be considered as meeting the requirements of the Smith-Hughes Act. Thus a land-grant college in order to receive Federal aid under this act for any of its work except teacher training, would be required to set up a separate organization of vocational work of less than college grade, and not supported by funds given to the college under any other Federal act.

A school or class will seldom be considered as less than college grade, if it requires high-school graduation as an entrance requirement. In such a case the burden of proof would rest upon the proponent of the suggested course to show in advance of its establishment that it is of less than college grade. This should not be so interpreted as to discourage high-school graduates from entering trade industrial classes. The point is that others not high-school graduates should not be excluded from such classes. In general anyone over 14 years of age with suitable general education to profit by the trade training should be admitted to such training.

Cases will be rare where difficulty will arise regarding the "grade" of the class. Perhaps the greatest care must be exercised where unit trade or industrial work is set up in institutions which give also collegiate instruction, and where colleges conduct evening industrial classes.

FEDERAL FUNDS MATCHED.

Federal funds must be matched by State or local funds or both.

For every dollar of Federal money expended in a State the State or its local communities, or both, must expend at least another dollar of public money for the same purpose. The State or local communities may expend the entire amount out of their own public moneys,

drawing upon the Federal funds for reimbursement, not to exceed one-half the amount expended. This requirement is to prevent the use of Federal moneys in aiding instruction maintained directly or indirectly by private funds, and to stimulate the State and local communities to support vocational education in a large degree by public taxation.

The State board should require all local boards, when making fiscal reports and claiming reimbursement from Federal funds, to make a clear statement that these funds came from the public treasury. The Federal Board will also require such assurance from State boards.

FEDERAL FUNDS FOR SALARIES ONLY.

The funds provided for trade, industrial, and home economics education can be ~~spent by a~~ State as reimbursement for money spent only for salaries of teachers actually engaged in instruction in schools and classes meeting the requirements of the act. No reimbursement is allowed for salaries of directors, principals, or supervisors when not engaged in actual teaching. The salary of any one teacher need not be paid partly by Federal and partly by State funds; the salaries of all teachers may be paid out of State or local funds, and reimbursement made from Federal funds upon the basis of the total amount expended for instruction properly entitled to such aid, without regard for the individuals whose salaries go to make up this total. When a State or local community pays out of its own funds the entire salary of a teacher, which salary is accredited for reimbursement out of Smith-Hughes funds, and after so doing makes application for this reimbursement, not to exceed one-half the salary, the Federal Board considers that the amount called for has already been legally spent for a teacher's salary as required in the act. It is this original salary payment, used as the basis of a claim upon the Federal funds, that must be under the control of the State board and concerning which the Federal Board must receive a report.

The actual money paid to the State or local communities as reimbursement for that already spent, is not a part of this fund, but may be considered a part of the regular finances of the State or community and, as such, expended in any way the local authorities desire.

Wherever possible, teachers paid in part from Federal moneys should give their entire time to approved vocational classes, and the prorating of a teacher's time between vocational and nonvocational classes should be discouraged. Where such prorating is absolutely necessary, it must be based on the whole school day, and not on the number of hours given to each kind of work.

For example, where a school day is eight periods, of which a teacher devotes three to vocational and four to nonvocational instruction, the amount of salary to be prorated, as entitled to half duplication from Federal funds, is three-eighths and not three-sevenths of the entire salary paid such teacher; thus three-sixteenths of the salary might come from Federal money. All such arrangements should be approved by State boards in advance.

In prorating a teacher's time, it must be remembered that Federal aid is given only for that part of the instruction given to segregated classes of the type specified in the law, and that no Federal moneys can be given in aid of mixed classes of any nature where there are some pupils who are not following full industrial, trade, or home economics courses as specified in the act. Thus a class in machine-shop practice, open to students following a regular course preparatory to the machinists trade and also to students enrolled in a general manual training or mechanic arts course, would not be Federal-aided.

The time of the teacher may be prorated as between classes, but not as between students, vocational and nonvocational in the same class.

Part II. ALL-DAY TRADE OR INDUSTRIAL SCHOOLS OR CLASSES.

TYPES OF ALL-DAY SCHOOLS.

The types of all-day industrial schools provided for in the Smith-Hughes Act—the unit trade and the general industrial—have been already defined. The general characteristics of these two types may be briefly resumed.

The unit trade school is prescribed for cities of more than 25,000 population and may be approved for smaller places. It is organized to teach one or more complete trades or occupations, each pupil preparing for a particular trade, and devoting his time to work wholly preparatory to entrance into that trade. Teachers are experienced in the trade they are teaching.

The general industrial school, permitted only in places of less than 25,000 population, allows the teaching of vocational work found to be the basis of several different trades and preparatory to entrance into any one of them. Pupils are permitted to take shop work leading to skill in allied trades, are not necessarily in groups studying one unit trade, and the teachers are not always specialists although they should be masters of at least one trade.

In the unit trade school, a class of carpenters would be a distinct class, preparing only for that trade and not reciting with other pupils. In the general industrial school those desiring to prepare for any of the building trades might be grouped together in a single class. Thus, a boy desiring to enter the carpenter's trade would be enrolled in that group and receive such instruction in the work of a carpenter as would be possible to give under these conditions.

SHOULD ALL-DAY SCHOOLS BE ESTABLISHED?

Before considering these types separately, a brief statement may be made concerning the necessity for the establishment of day schools.

Any community, even the larger cities, should consider carefully all aspects of the problems involved in establishing day schools for particular trades or industrial pursuits, before appropriating money for this purpose. The Federal Board believes that the establishment of day schools or classes should not be undertaken by any

community until a need is shown. In many cases vocational education will best be promoted through the establishment of part-time and evening classes. Congress evidently regarded part-time instruction, both trade-extension and general continuation, as of greater importance than instruction in all-day schools, when it provided that a certain fixed amount of the fund for trade and industrial education must be spent for part-time schools and classes if spent at all.

The Federal Board appreciates fully the value of a good general education as the foundation on which to build efficient vocational training, and is therefore heartily in sympathy with any movement to keep the children in the regular public school as long as they are able to profit by the training which they thus receive. It is aware of and in sympathy with the modern enrichment of the elementary and secondary courses of study through the addition of practical innovations in the way of vocational guidance, prevocational work, junior high-school courses, and various other types of instruction in which opportunity is given for practical work. Beyond the general elementary education, it believes in certain types of specialized education such as that given in manual training high schools, practical arts high schools, and technical and commercial high schools, with the understanding, however, that whatever may be the excellence of such education and its leaning toward vocational education, it does not constitute a form of industrial training which can be subsidized under the Smith-Hughes Act.

The Federal Board believes in the careful selection of a vocation, but deprecates any effort to establish day trade or industrial schools at the expense of enrolling in these schools pupils who should continue their general education or who have been urged into making a vocational choice without adequate reasons for such a choice.

The Federal act makes it clear that Federal aid can not be extended to the payment of the salaries of teachers who are engaged in any of the desirable activities mentioned in the preceding paragraph. It may be restated here that the Federal act provides money for the part payment of the salaries of teachers of trade and industrial subjects in classes giving instruction in a given trade or industrial pursuit, and to pupils who are preparing to enter the trade or industrial pursuit taught in the class, i. e., to those who have made an intelligent vocational choice. When such a group is found no community can go far astray in the establishment of a day industrial school.

CONFUSION OF TERMS.

A considerable confusion has arisen from the way in which the terms manual training, practical arts, technical classes, vocational guidance, prevocational work, and vocational work have been used

in school circles. The Federal Board does not feel that it is charged with responsibility in framing exact definitions, except in so far as the administration of the Federal act is concerned. It is interested, however, in determining whether a school or class is organized to carry out the purpose of the act no matter what name may be given locally to the activity carried on in the school.

There might better be a slow development of day trade and industrial schools under the controlling purpose of useful employment, rather than a rapid development leading to the establishment of schools whose purposes are not clearly and specifically defined in terms of vocations.

It must not be inferred, however, that the Federal Board does not urge the establishment of day schools wherever they are needed. It does wish to emphasize the great possibilities in part-time and evening school work, to which as great attention should be given as to the possibilities of day schools.

The question is also to be considered if the establishment of evening and part-time schools should not logically precede the establishment of day schools. Certainly any community which can maintain a successful all-day trade or industrial school will also need evening and part-time schools. If it can be shown that there is a growing need for evening schools, it may be easier to establish day schools. Again, the cost of establishment of day schools is high, while that of evening schools and part-time schools is comparatively low, enabling a community to begin a program of industrial education without a large expenditure of money.

I. THE UNIT TRADE SCHOOL.

CONTROLLING PURPOSE.

To fit for useful employment is the controlling end and aim, the standard of valuation, and the final definition of vocational education about which the whole Smith-Hughes Act is written. The entire act may be summarized in one brief sentence: It is an act to promote education which fits for useful employment.

Upon the practical interpretation of the phrase "to fit for useful employment" will depend the success or failure of any day school or class organized under any plan adopted by a State and approved by the Federal Board.

Fitting for useful employment in industrial education means fitting for effective entrance into a particular trade or industrial pursuit. This is shown in the words of section 11, "That such education * * * shall be designed to meet the needs of persons over 14 years of age who are preparing for a trade or industrial pursuit," and also in the clause from the same section, "that the State

or local community, or both, shall provide the necessary plant and equipment determined upon by the State board, with the approval of the Federal Board for Vocational Education, as the minimum requirement in such State for education in any given trade or industrial pursuit." Only one conclusion can be drawn from these two statements, and that is that the work must be of such a nature as will fit pupils for the practice of a particular trade or industrial pursuit.

One important implication in the provisions of the act should be noted. Obviously, work designed for a particular trade or industrial pursuit implies that election of a specific vocation has been made by the pupil. Such work can not advantageously be given to persons who have not made a choice of vocation. A course in plumbing has value for pupils who have elected plumbing as the trade in which they will earn their livelihood. For those who have not elected this vocation such a course has not sufficient value to justify the expenditure of public money in providing it.

It may be well in this connection to note that the sort of education fostered under the Federal act is not intended for backward, deficient, incorrigible, or otherwise subnormal individuals. Such education is intended for, and should command the best efforts of, normal boys and girls. Experience shows that pupils failing to make normal progress in the elementary schools rarely do satisfactory work in industrial schools. Ability to do the work of the all-day industrial school should be the determining test even after admission, and a probationary period of attendance will commonly be required to enable the school to determine which of the girls and boys enrolled are capable of carrying on the work.

AGE OF ADMISSION.

Instruction must be "designed to meet the needs of persons over 14 years of age," and pupils under 14 can not be admitted, "unless it can be clearly shown that they are fully able from the point of view of physical fitness and mental attainments to carry on the work designed for pupils over 14."

While a minimum age of 14 is the only requirement in the Smith-Hughes Act, the Federal Board recommends that care be taken to secure pupils who are physically and mentally able to do the work required.

Experience has shown that it is extremely dangerous to admit pupils under the age of 14. There is much criticism even of this age standard, on the ground that pupils of such immature age can not have given enough consideration to the vocation which they have chosen to be sure that their choice has been wisely made. As has

been the case in many other fields of activity where a minimum age is designated, the tendency is to fix the minimum as the ruling standard. Nothing in the law, however, compels a State board to fix upon 14 rather than 15 or 16 as the minimum age for entrance to trade or industrial schools.

In some communities a tendency has been manifested not only to make 14 the usual age of entrance upon the study of vocation, but further, a tendency to discourage entrance upon the course by pupils who have made regular or rapid advance in the public school system. The Federal Board can not approve a condition which results in the organization of trade or industrial classes for undesirables separated from the regular public school work and placed in these classes.

NECESSARY PLANT AND EQUIPMENT.

The plant and equipment for a unit trade school will require more care in selection, more space for installation, and more money for purchase than those of any other type of industrial school, giving instruction in the same trades.

Definite standards can not be set up at this time, but in general, in the case of all-day schools, as in the case of other schools, State boards must be held responsible for determining that the plant and equipment are adequate, standards set up by State boards being in every case subject to approval of the Federal Board.

Federal money, it should be borne in mind, is not available to cover any expenditure for plant or equipment.

Buildings.—The Federal Board has in preparation a bulletin on buildings and equipment which will be available soon for the use of State boards and local communities. In this bulletin it is pointed out that three types of buildings may be utilized by all-day schools:

(1) New buildings specially designed for a trade or industrial school.

(2) Old school buildings converted or adapted to vocational school requirements.

(3) Unoccupied factory buildings, when suitable.

Day schools have, in the past, most commonly been organized in abandoned school buildings, and possibly this practice will continue, since the establishment of a day industrial school must be usually in the nature of experimentation and development.

Communities at the present time need not, however, enter upon day trade-school work as being purely experimental. In the last few years surveys of cities and States have demonstrated the possibility of determining beforehand the principal requirements. Whereas, smaller details of program and policy must be a matter of development and experiment to some extent, the larger issues, involving the

need for all-day schools, the selection of trades, numbers to be reached, character of building, and equipment, may be well defined at the outset. There is no longer any necessity for installing this work in a blind way, or for wasting money on useless equipment.

Communities are especially urged to provide in their plans for extension and growth. Every building should be planned to allow for normal growth both in size of classes and in number of trades taught, and it should also be planned to house not only day school activities, but, as well, part-time and evening schools.

Special industrial equipment.—Equipment in nearly all trades is changing from year to year, and, while much of the expensive machinery of school equipments may remain in use for considerable periods, tools, new parts, machine accessories, jigs, etc., must change constantly to keep the equipment up to date.

State boards should approve local equipments before making reimbursements from Federal funds for the salaries of teachers who are to use these equipments. In each instance, approval should be for a particular school, and should be given separately for the equipment of each trade taught in the school. The State board must in each case assure itself that the equipment is sufficient in quantity and variety to enable all departments to give instruction in all the standard methods of the occupation for which the school proposes instruction. As in other types of instruction, special and general equipment are required. The first includes the machinery with its installation, and the tools of operation. This especially should be approved by the State board, the approval extending to the method in which the equipment is installed, and making certain that all State laws and the rules of Safety Commissions or similar bodies in the State have been observed.

Absolute compliance with every provision of the factory and child-labor laws relating to equipment and safety devices is essential, and the liability of the school for accidents due to manipulation of machinery should be carefully determined. The State board should ascertain that all rules and regulations regarding posting rules and cautions, safety devices, protection from running parts, electric conduits, etc., are being considered and complied with when machinery is being installed.

A community, before installing a special equipment, should endeavor to ascertain the views both of employers and employees in the community, concerning what is an adequate equipment for the particular trade, what particular machines should be used, their method of installation, and the number of machines. A school should not make the mistake of copying without careful study of local conditions the equipment which seems to have proved effective in the organization of a vocational school in a distant part of the

country. By the use of such advisory committees as those suggested for part-time and evening schools, the local school board and the State board of education can be fairly well assured that only standard equipment found in modern commercial establishments will be installed. It should be mentioned, however, that the school board should call to the assistance of the advisory committee some one who has had experience in teaching the trade which it is proposed to organize into a day school. The school board should not take the advice of the advisory committee without checking it up wherever possible, through the experience gained by other communities. Men engaged in the work of a particular trade and employers are apt to consider the equipment from the standpoint of production rather than education of pupils, as being of paramount importance for a school equipped with the implements and machines of production.

General equipment.—Books, apparatus necessary for teachers of related science, charts, blackboards, and desks constitute the principal items of general equipment. The usual standards observed in the State for general equipment in general schools will be satisfactory as far as this part of the equipment of vocational schools is concerned.

MINIMUM FOR MAINTENANCE.

All the variations of community size, local prices, types of classes, trades given, and teaching force, that must be taken into account in providing maintenance for other types of schools make it practically impossible to specify fixed amounts and standards for unit trade work. It will, however, be necessary for State boards to assure themselves more carefully even than in the case of other types of schools, that ample money for maintenance has been provided.

In reviewing a maintenance budget, State boards should regard with special attention certain points, some of which may be indicated.

Cost of teaching.—The all-day industrial school, and especially the unit trade school is, of all vocational schools, the most expensive to maintain. Much of the expense is incurred in providing sufficient salaries for teachers. To carry a pupil through every stage of trade instruction extending over a four-year period, or even a two-year term of full day instruction comprising advanced processes and principles, requires an exceptional teaching staff. The highest standards of instruction must be maintained—higher and more complete than in other vocational schools—and the teachers to provide this instruction must receive commensurate salaries. The salaries of these teachers, it must be remembered, constitute as a rule their entire income.

Part-time and evening teachers may be secured who, being commercial wage earners, consider their salaries for teaching as so much clear gain. All-day teachers have no other wage income, and just now, when the demand for labor is excessive, they are being offered every financial inducement to return to the field of production. Only salaries greater than or equal to the best trade offers will hold them in school. Furthermore, budgets must be flexible enough to allow for reasonable increases in salaries, not only from year to year, but even within the year, otherwise teachers will be drawn away whose places can not be properly filled. Conditions vary from State to State and even within the State, depending largely upon the number available for teaching positions, size of city, local cost of living, and current wages.

The Federal Board will approve a minimum salary standard set up by a State board, if the minimum is a safe one to adopt. In fixing minimum salaries, State and local boards should realize that, through the use of Federal funds, the burden of high salary costs is in part lifted from the local community, making possible higher salary scales. The Federal Board can think of no better use or reason for the disbursement of a Federal fund than that more efficient teachers shall be secured, and it believes that efficiency in teaching bears a direct ratio, within reasonable limits, to the salaries of the instructors, provided that care is taken in their selection.

Salaries paid to regular elementary or secondary teachers can not be taken as standards upon which to base a schedule for teachers in unit trade schools. In selecting the former there is no competition with industry, no shortage of good applicants, and no lack of special training. In the latter case, decidedly higher salaries are required by all these factors. Moreover, Federal funds are available to equalize the burden on the local taxpayer. In most cases a \$3,000 industrial teacher can be employed by an expenditure of from \$1,000 to \$1,500 of local money, the balance being paid from State and Federal funds.

Because of the use of State funds, and because the State is custodian of the Federal money used, the State board should protect itself by reserving the right to disapprove provisions made locally within the State for maintenance, so far as teachers' salaries are concerned. The success of schools will certainly depend to a greater extent upon the kind of teachers employed than it will upon plant and equipment.

Other maintenance.—Besides salaries, other forms of maintenance must, of course, be considered. The unit trade school has usually a longer school day than the regular school or other forms of industrial schools. Large and expensive machinery is needed for most

trades taught, since the work is all done in school. Upkeep, replacement, and care of this machinery are important items of maintenance cost, as are, also, care and labor in selecting, buying, and accounting for supplies, in addition to the cost of supplies.

Supplies are expensive and must be provided in quantities. This cost again varies according to trade, and according to amount of usable product which can be produced in the shop. State boards of education should take into consideration the disposal of the product of the shop, in order that actual cost of maintenance may be correctly determined. It is unfair to the vocational school to charge against maintenance the cost of lumber which is made up into teachers' desks, bookcases, telephone stands, typewriter desks, or filing cases, as products of a school giving instruction in furniture making. The amounts which the schools would have had to pay, if they had bought these products in the open market, should be deducted from the gross maintenance cost of the school in furniture making.

At the best the per capita cost of a vocational school will be higher than the per capita cost in other secondary school education. If the community is not willing to pay the price, it should not be encouraged to undertake the establishment and maintenance of a day school. Total cost and net cost are, however, very different things, and the amount obtained by the sale of products manufactured in the school must be treated as an asset in determining the net cost.

It would be a serious mistake, however, to assume that a school in which shop work is conducted on a useful or productive basis will pay for itself. It is improbable, even, that the product will pay for materials and supplies, since it is fundamental that the shop work, although it is organized on a useful and productive basis, shall be conducted in such a manner as not to exploit pupils who are receiving instruction. The prime purpose is to give instruction, not to produce a salable product.

CHARACTER AND CONTENT OF COURSES.

The act requires that a specified proportion of the instruction time in day schools shall be devoted to practical work, and experience in this country during the last 10 years has established the following apportionment of time as the prevailing practice:

(a) At least one-half the time to practical work on a useful or productive basis.

(b) From 30 to 35 per cent of the time to related studies, such as mathematics, drawing, or science.

(c) The remainder of the time (15 to 20 per cent) to such subjects as English, civics, hygiene, and history.

All work must be inherent in the vocation taught and calculated to enlarge the trade knowledge of the worker. To quote from the board's statement of policies—

In a machine shop which gives at least three hours a day to shop work, a part of the remaining time might be given to such topics as machine-shop mathematics, drawing and science as related to the machine-shop trades, science applied to the machine shop, and the hygiene of the trade. In a school which teaches printing, time devoted to related studies might be given to such subjects as estimating costs, English for printers, art in printing—such as the layout of a paper, proper margins, and title-pages—science as related to printing, and hygiene of the trade. Before such work in related subjects can be reimbursed from Federal funds, the State board must be satisfied that the teacher has had satisfactory contact with the vocation in which the related work is supplementary.

As regards the supplementary instruction "necessary to build a well-rounded course of training," the Federal Board's interpretation of the act is indicated in the following statement of policy:

The language employed in the provision in regard to well-rounded courses of training contains no intimation as to whether it was intended that such courses should be required and standardized by the Federal Board. The incorporation in the act of this provision, however, is strong evidence that it was the intent of Congress that such courses could properly be required in some cases. The main purpose of the clause is obviously to provide that the cost of supplementary instruction shall not be borne out of the appropriations made by the act. But if it was not intended that such instruction might be properly included, in certain cases, in the courses of study to be given in the schools and classes aided by Federal funds, the enactment in regard to the cost of such instruction would be of no force and effect. Congress, by providing in section 8 that the plans submitted by the State board must be passed by the Federal Board, clearly vested in the latter authority to refuse to approve such plans as did not, in its judgment, contain courses of study necessary to accomplish the purposes of the act. It is the duty of the board, therefore, to determine, upon the submission to it of plans, the questions whether provisions for supplementary instruction should be included therein. Thus, in proper cases the board reserves the right both to require and standardize such courses. (Bulletin No. 1, p. 31.)

In formulating a course, any unit trade, or day industrial school which is to receive any Federal aid must regard the conditions set up in the act, namely, that the course shall be one intended for persons 14 years of age who are preparing to enter upon a particular trade or industrial pursuit; that the work shall be of less than college grade; that one-half of the time shall be given to work on a useful or productive basis; and that provision shall be made for instruction which is supplementary to shopwork, and for subjects which go to make up a well-rounded course.

The Federal Board, in its statement of policies, indicated the customary division of time between related-subjects work and non-vocational work, and although it was pointed out that this apportionment was tentative, it has been rather closely adhered to in the organization of courses for day schools. The board wishes to leave to local authorities the greatest possible latitude, as to the division of time, and it believes that in many instances a larger percentage than 50 should be given to shopwork.

Nevertheless, the board must require adequate provision for related-subjects work. Since every course is to be planned for persons who have already chosen their employment and for persons who are willing to give considerable time, not less usually than one year, in special preparation for the selected employment, it would be unwise to plan a course which did not give adequate opportunity for study of the theory of the trade as well as for concrete shop experiences, or a course which did not provide opportunity for thinking about the shopwork or concrete experiences.

The aim should be both to train a mechanic to produce satisfactorily in high-grade positions, and to make the mechanic a thinker with larger vision of his work and vocation.

The effort to equate the experience and study required in a trade school in terms of college entrance requirements or in terms of a general high-school education can not usually result in an efficient industrial school. The board is thoroughly in sympathy with the wide sentiment that is making four-year high-school education more general, and looks forward with expectancy to the time when our high-school registration may be doubled by the introduction of greater variety in the courses of study, by a more definite relationship to life in methods and subject matter, and by a stronger appeal for vocational preparation for those not contemplating a college course. The trade school, however, can not be measured by high-school standards, either of entrance or graduation, no matter how long its course may be. Wherever such standards are set up, the school usually soon ceases to be a trade school, and becomes a technical or industrial high school.

The board is, however, disposed to allow the greatest latitude consistent with its legally imposed responsibilities, to the States in providing in their plans for courses formulated to meet the needs of particular communities and occupations. It recognizes how impossible it is to formulate a course in any trade which will be adapted to conditions in all parts of the country.

Each course should be subject to approval separately in the several communities. In other words, no course should be imposed upon a State or local community regardless of particular needs. State plans should, therefore, lay down general principles in accordance with

which courses are to be organized, designating the limitations as to time for shopwork, for related-subjects work, and for nonvocational work, and should submit to the Federal Board, with these general provisions, sample courses in ~~the~~ various occupations which the State has recognized as necessary to the proper development of its industrial education program.

A State board should require a local community in writing a course of study to secure assistance from:

(a) Conferences at which are present the teachers of the special subject, representatives of employers, and representatives of employees.

(b) Survey analyses of occupations—notably, those contained in the Richmond, Minneapolis, and State of Indiana vocational surveys; in the New York City Industrial Education Survey; in the publications of the United States Shipping Board educational staff; and in the bulletins of the Federal Board.

The Federal Department of Labor also has published documents which will give assistance.

Having made this preliminary study concerning the occupation, the local authorities, possibly assisted by the State supervisor, should endeavor to fix the order of the various operations and experiences required to give an adequate experience in the occupation in proper sequence for teaching, keeping in mind the points which will be mentioned below under “Methods of instruction.”

Following the same plan, the sequence of related subject matter, whether in mathematics, drawing, or science, should be determined upon and should follow closely the sequence provided for experiences in shop work.

In the examination for approval of a particular course of study the State board of education should have in mind the following points upon which to base approval:

- (a) Aim.
- (b) Scope of the work provided.
- (c) Content of the course.
- (d) Order of presentation of content.

METHODS OF INSTRUCTION.

Effective methods of instruction will provide a sequence of experiences and of thought about experiences, which will enable the pupil to acquire as rapidly as possible manual skill and dexterity in the various operations of the trade or industrial pursuit for which he is preparing. They will develop ability to think and to work intelligently in the trade.

Certain principles that will be followed in any good method of instruction in an industrial school may be indicated:

1. Instruction should be based on concrete experiences.
2. Instruction should proceed from the concrete to the abstract.
3. The work should be a progressive training process. Correct methods of instruction will so determine the order of experiences that the progressive development of the pupil will be assured.
4. Finally, the individual or task method of instruction, rather than the group or class method should be employed, differentiating between a problem or task and an individual project.

Methods must also allow for 50 per cent of the work at least to be done in the school shops. They must allow, also, for the use of graphs, charts, and diagrams in the classroom for related subjects; for the use of lantern slides, and commercial catalogues. Emphasis should be placed upon utilization of trade problems. Visits to commercial shops and reports on such visits should be required. Lesson sheets compiled from various sources and experiences should be provided. Correlation between the work of classroom and that of the shop should be perfect. As many other helpful devices as possible should be employed.

AT LEAST HALF OF THE TIME TO PRACTICAL WORK.

Schools or classes must give at least half the time to practical work. This is not optional but mandatory. Not less than 15 hours a week must be set aside for practical work. Whether this minimum of 15 hours of practical work shall be given for three hours a day, or on alternate days, or by any other distribution of time, is left to the discretion of the State board proposing the plan.

It is to be noted that this is a minimum standard, and that no maximum is designated. There are probably cases where a greater proportion than one-half of the time should be given to practical work. In classes where the maturity of the pupils will permit, and where the character of the work makes it desirable, there is no reason why the proportion should not be greater. Generally where the trade or industrial pursuit is of such a character that little related or theoretical work can be given, it is advisable to lengthen the time of shop work.

PRACTICAL WORK ON A USEFUL OR PRODUCTIVE BASIS.

Probably no standard among those given is harder to apply than that set up in the provision that work shall be on a useful or productive basis, and probably no topic discussed by persons engaged in vocational education develops a greater variety of opinion. There is

no unanimity of opinion as to what constitutes work on a useful or productive basis.

The interpretation of the Federal Board is as follows: "This is interpreted to mean work similar to that carried on in the particular trade or industry taught. Such work is on a useful or productive basis when it results in a product of economic value comparable with that produced by a standard shop or factory."

Some people fear that pupils engaged in work on a productive basis will be exploited; that the market may be over supplied with product from the schools; that production in a school shop reduces the industrial demand for labor; that the school products will be sold at lower than market prices. It is sometimes feared also that with the emphasis on "useful or productive," the educational values of the work will be lost sight of.

It is difficult to conceive of work on a useful or productive basis without a useful product. Administrators of vocational schools and teachers of shop subjects find it difficult to provide such work in many occupations in which instruction is given. Some further interpretation, therefore, which will enable State boards to determine whether work is being conducted in accordance with the terms of the act may be helpful.

(1) Work on a useful or productive basis can be given only in a shop equipped with the machinery and tools used in industry, adequate in number and variety.

Thus, for a shop trade like that of machinist, there must be furnished lathes, planes, shapers, millers, grinders, drill presses, boring mills, and other machines of the same type as those used in commercial shops, to the extent that operation of these machines is included in the course. For training an all-round machinist all of them and more are needed; for training a special hand one or more may be required.

For a nonshop trade, such as that of the bricklayer, an equipment must be furnished duplicating that used in the trade, though the work may be arranged for under the school roof. Thus, space must be provided for full size work on walls and chimneys, using standard bricks, mortar, and tools. This case is cited as one on which it is particularly difficult to provide work on a useful and productive basis. Some work of the exercise and practice order must be given, such as the building and tearing down of walls, but the school must also provide opportunity for real productive work, producing products of actual value and permanent use. This can be done by building for the school or community, putting walls around school yards, laying foundations for one-story buildings to be erected by wood-working pupils, or even by building and selling a brick house. Students may also be "apprenticed," so to speak, to bricklayers to help

in actual production and construction—an especially good plan where help is scarce, and the sale of school products is not practicable.

In some occupations, such as carpentry, which are partly shop and partly nonshop, both of the above methods can be employed, the shop work being arranged in the school and the nonshop work most easily handled by agreement with a contractor. Employment can be arranged for, out of school hours, in vacation times, and during special leaves of absence from the school.

It is to be noted, however, that vacation employment does not count on the regular three hours constituting the minimum time to be devoted to work on a productive basis. Neither can the employment be hit or miss employment. The suggestion of vacation employment is intended to encourage this desirable supplementing of regular work.

(2) The instruction must be given by a teacher who is thoroughly acquainted with the commercial processes of manufacturing used in the trade taught.

(3) The school product must be as nearly like that produced in the commercial shop as possible.

(4) Pupils must be kept on one operation or type of work until they have acquired the requisite skill but not longer than that, to increase production. Educational value rather than product should always be regarded.

(5) The productive work in the shop must be on an organized basis, and the methods of production must be similar to those employed in a modern commercial shop.

DISTINCTION BETWEEN PRODUCTION AND EXERCISE.

The Federal Board believes that it was the intent of the law, in requiring that the work shall be conducted on a useful or productive basis, to distinguish sharply between such work and the over-analyzed, over-organized, and stereotyped courses of shop work which were in vogue as the result of the introduction of manual work into many technical and manual training courses. These courses are often based upon the academic idea of mental discipline, transfer of skill, and development of the senses, and while the board has no fault to find with such courses in their place, it does not believe they comprehend what must be the controlling purpose of a shop organized on a productive basis.

Shop work on a productive basis must be distinguished from shop work on a purely exercise basis, "which analyzes the processes necessary to the making of a finished product and then teaches these processes through a series of disconnected exercises which does not produce the finished product on a commercial or other basis."

An illustration may be taken from furniture making, which is often a phase of manual training activity taught in school, and is also a trade which may be organized in the vocational school. In the usual manual training shop, the work is largely individual, sometimes on a series of models, and sometimes it takes a long time for one pupil to complete a single piece of furniture. In the commercial shop, in which the furniture-maker will work, labor is organized to run special machines and perform special processes differentiated with a view to production on a quantity basis, and not with a view to production of complete pieces of furniture by individual workers severally.

The Federal Board realizes that in the early stages of teaching shop work it may not be possible to place the work strictly on a productive basis, but it believes that in a productive shop there can be a minimum of exercise work, and that exercise can always be followed by practical application of results in the processes of commercial production. A machine shop course might thus need practice pieces or practice work to develop skill in certain processes; but the instructor should always have in mind the use of the same processes in actual production, and should apply them as soon as possible to work of a commercial nature.

DIFFERENCES BETWEEN THE COMMERCIAL SHOP AND THE SCHOOL SHOP.

The tabulation given below is an attempt to express, in parallel columns, the principal difference between the commercial shop and the school shop conducted on a useful or productive basis:

PRINCIPAL DIFFERENTIATING CHARACTERISTICS—

OF THE COMMERCIAL SHOP IN BUSINESS.	OF THE SCHOOL SHOP CONDUCTED ON A USEFUL OR PRODUCTIVE BASIS.
1. Money-making enterprise.	1. Educational enterprise.
2. Considers maximum of profit.	2. Considers maximum of educational values.
3. Keeps man on special process to secure maximum output. Production.	3. Keeps student on special process only until skill in special process is sufficient to warrant advancement.
4. Has usually no primary interest in providing variety of experience.	4. Tries to give a complete round of experiences.
5. Aims at production of goods.	5. Aims at production of skill.
6. Marketable product is the primary aim.	6. Marketable product is the secondary aim, but necessary to give adequate training.
7. Interest in materials.	7. Interest in human beings.
8. Individualistic interests.	8. Society interests.
9. Serves private capital.	9. Serves state.
10. Immediate profit.	10. Future welfare.
11. Concerned with competition.	11. Not concerned with competition.

The above tabulation is essentially true, even though good commercial establishments often introduce educational values in their work, especially where they train foremen who train apprentices.

PRODUCTION VARIES WITH TRADES.

Amount of product will necessarily vary from trade to trade. It is more difficult to provide useful or productive work, for example, in electric wiring than it is in printing. Also, it is easier to lay out projects where the product is portable, as in the case of a machine-shop or a printing-shop product, and easier, therefore, to conduct the work on a useful or productive basis, with the assurance that the product will be utilized, than it is in such trades as carpentry, electric wiring, bricklaying, and plumbing, where more work on what might be termed the exercise basis must be provided. It is essential, however, that in the latter type of shops (1) all work which is conducted in the school shop be of such a nature that it will produce skill on the outside job, i. e., in the trade the pupil expects to follow; and that (2) activities shall be carried on outside of the school shop in order that the work may be useful or productive. Where the skill acquired in the school shop is that of operation rather than production, it is necessary for the school to make such contacts with industrial life outside as will provide opportunity to put into use the operation learned in the school shop as soon after teaching it as possible. For example, under certain conditions those in the carpenter's trade might acquire skill and increase their knowledge by being drilled on practice pieces in the shop before going on the regular work.

The experience of the best industrial schools goes to prove that if shop instruction is to be efficient as a means of training for industry, it must be so conducted as to result in a product that can be put to some practical use. If, however, the school is so conducted as to provide thoroughly for the educational needs of the prospective workers in the trade, the output will necessarily be small. Usually in a school system of fair size practically all the output can be used in the school system itself. While the amount of output from the shops will be small, a usable product is necessary, if for no other reason, to avoid the waste and misuse that results from breaking up the product or giving it away for private use. Furthermore, a usable product, practical in character, made in response to an actual demand, is the only guaranty that the shop training is practical.

The best features of commercial shop organization should be adopted in the school shop in such matters as planning and routing jobs, checking and inspecting work, order systems, cost and production accounts, time accounts, records showing the movement of stocks

and jobs through the shops, tagging and repair of incapacitated machines, and other details of shop management. If the school is to instruct boys efficiently in the principles of shop organization and management it must duplicate the best features of commercial shop management, and must duplicate actual shop organization, using the individual method of production only where it is used in industry and the group method where it is commonly used.

INSTRUCTION MUST EXTEND OVER NOT LESS THAN NINE MONTHS PER YEAR.

As interpreted by the Federal Board this requirement imposed upon day industrial schools means that such schools must be in session each year during nine months of four weeks each, "regardless of the calendar months, and including only such holidays as are commonly observed by the regular public schools."

A tendency to provide for a practically continuous session of public schools in what are termed "all year schools," has been manifest in American cities, and in several the day industrial schools are organized for 48 weeks of instruction. Nine months is a minimum; more than that may of course be given by any school.

INSTRUCTION MUST EXTEND OVER NOT LESS THAN 30 HOURS PER WEEK.

By hour as has been noted the "clock hour" of 60 minutes is intended, and the requirement of 30 hours per week is, also, a minimum standard fixed by the law. In practice schools have very generally adopted a six-hour day for five days a week. It would be perfectly possible to have a school organized for six days a week for five hours a day, or for four days a week of seven and a half hours a day. Usually States have provided in their plans for the minimum only, and have left the way open to local communities to increase the number of hours at will.

There is a widespread movement to increase the daily time of instruction, and experience shows that a longer school day than is required for the regular secondary school is absolutely essential for an industrial school. There are two principal reasons for a lengthened day for trade or industrial schools in addition to those usually given for the lengthening of the school day in general.

(a) The nature of the work requires that a maximum of time, usually 80 to 85 per cent, shall be given to shop work and related subjects. This work requires the presence of an instructor in order that it may be carried on effectively, hence there is little opportunity or need for home study.

(b) Since the pupils are preparing to enter a trade, the hours they give to work in the school should approach the hours they will be required to give to work in the trade.

State boards should call the attention of local communities to the possibilities of a lengthened school day. The actual length would depend largely upon the age entrance requirements, which may be fixed above the minimum requirement of 14 years. Where the age of the pupils is 16 or 17 years, the day may very well be lengthened to 7 or 8 hours.

A school day gradually lengthening as the course advances by years may be recommended for consideration. Such a gradually lengthening period of daily instruction would provide more time for an increasing amount of related subjects work in the latter part of the course, which is often desirable.

GENERAL QUALIFICATIONS OF SHOP TEACHERS.

In the approval of State plans during the present year, the Federal Board has refused to approve any plan which did not provide for adequate practical experience on the part of the teachers who were to be employed as shop work teachers. There is practical unanimity in the plans in requiring that at least three years' experience beyond the apprenticeship stage shall be possessed by prospective teachers of shop subjects in unit trade schools. The Federal Board realizes that qualifications may vary locally, and from trade to trade, but it believes that three years' experience is a reasonable requirement.

Adequate vocational experience can rarely be secured in a school. As a rule, no graduate of any school, trade or technical, is prepared to become a shop teacher in a unit trade subject without having had an adequate experience either before or after graduation in the work of the particular trade under commercial conditions. The Federal Board is anxious to secure shop teachers with as much general education as possible, and it hopes that the time will come when graduates of higher technical schools who have had an adequate experience may be induced to enter the ranks of vocational school teachers, but it believes that if it has to make a choice between men with adequate trade experience and no higher education on the one hand, and on the other graduates of higher institutions with an inadequate shop experience, it will make no mistake in choosing the former, it being always understood that the combination of shop experience and higher education, if it can be secured, is most desirable.

In the emergency which has existed in the organization of trade schools or classes, it has been necessary to select teachers who have secured their shop experiences as actual workers in the trade, and it is also probable that in some States, for a long time to come, teachers must be so selected. This is but another way of saying that at present few schools, if any, give a trade training sufficient to warrant graduates being selected as teachers without further experience.

CERTIFICATION.

In order that teachers with necessary trade experience may be secured, many of the States have had to modify the usual certificating rules. There does not exist an adequate supply of shop teachers with the requisite trade experience who have had, in addition to this, a general education extending much beyond the elementary school stage, and if high-school graduation were made a requirement for the shop teacher the supply would be very limited. While adequate general education is important as a qualification for teaching, the chief duty of a shop instructor is to impart to others skill and knowledge of trade processes; hence trade experience and success must always be the principal criterion in selection of such an instructor.

The following quotations from the Federal Board's Statement of Policies bear directly upon this matter of certification:

The practices of the several States in certificating teachers necessarily affect the standards and policies of the State in certificating teachers of vocational subjects.

The State board may use Federal moneys for teachers of vocational subjects if they meet the qualifications agreed upon by the two boards even though such teachers may not have been certificated to teach under the State laws. In most States, however, teachers must hold certificates before they can legally be paid for their services by the State or community. The Federal Board views certification from the standpoint only of a device which may assist or may handicap the State board in securing and holding competent instructors.

The situation as to certification varies widely among the States. In States where the legislature has prescribed in detail the subjects in which teachers must be examined for every kind and grade of license and has left practically no power in the hands of the State educational authorities to issue special licenses for teachers giving instruction in vocational education, the Federal Board will make such adjustments as it deems necessary. Should it be of the opinion that the system of certification interferes with the proper selection and employment of teachers receiving Federal moneys, it will give notice that at the next session of the State legislature remedial legislation should be introduced.

Where the chief school officer of the State or a certificating board is empowered to issue special certificates, this authority should be used so as to establish flexibility in employing and certificating vocational teachers.

Since the State laws governing the examining and licensing of teachers were in most instances framed before the rise of vocational education, few of them are adapted properly to meet the task of selecting and testing teachers for this new field. New standards and requirements are demanded. Experience along practical lines must be measured. Mechanical skill and the ability to use technical knowledge in a practical way must be tested. For many positions special skill and technical knowledge rather than general ability must be sought. In many cases practical tests should be given in place of, or supplementary to, written examinations. Evidence of successful experience in a vocation, as well as teaching, should have large weight. The help of the layman, particularly of the practical man, should be used in determining the standards and tests by which the worth of the applicant for the teaching of any given occupation or trade is to be determined. This is equally true

whether it be a question of trades and industries or agriculture or of home economics.

Whether the present State provisions for certification admit of no flexibility, or whether the State superintendent has power to deal temporarily with the difficulty by issuing special licenses, the Federal Board is of the opinion that the next session of the legislature in every State should commit the whole matter of examining and certifying teachers of vocational subjects into the hands of the State board for vocational education, giving it power to establish from time to time such standards, tests, rules, and regulations governing certificates as that board may deem advisable.

RELATED SUBJECTS TEACHERS.

What has been said regarding the certification of shop teachers applies in very large measure to related subjects teachers as well. There is considerable variation in the standards set up in the several State plans approved by the Federal Board in so far as related subjects teachers are concerned. It may be said, however, that the general tendency has been to set a standard of at least two years of preparation, above the high school, in a technical school or in a school which provides for shop experiences in the trade for which related subjects work is given. In certain cases, the provision has been made that graduation from a secondary technical school, together with adequate experience in the trade, after graduation, should be the minimum qualification.

While no uniform standard can be set up for the several States, the Federal Board believes that adequate contact with the trade is essential; and that in the revision of plans each State board should provide for a more complete statement concerning the minimum qualifications of the related subjects teachers.

The ideal situation in a vocational school will be to have the same qualifications for both the shop teacher and the related subjects teacher but, owing to the lack of teachers who possess such training, it probably will be necessary for some time to come to differentiate between the qualifications of the shop and of the related subjects teacher—requiring more shop experience for the shop teacher, and more technical education for the teacher of related subjects.

While related subjects must be strictly vocational and inherent in the trade, they are of such a nature that they may be taught in the ordinary class room or science laboratory. A high degree of scholastic preparation may, in some cases, be required for teachers of trade drawing, mathematics, and science, and such teachers can be recruited from graduates of secondary technical schools who have had commercial experience; from graduates of engineering schools of collegiate grade, or from persons who have had a partial course in such institutions; or from among the graduates of institutions which prepare teachers of manual arts subjects. The latter have

usually been prepared in manual arts departments, and their shop experience, general education, and training in related subjects will generally be adequate.

NONVOCATIONAL TEACHERS.

Since the local school or the State is required to bear the entire salary expense of teachers in nonvocational subjects, the Federal Board will not fix standards. It will, however, approve standards for nonvocational teachers which may be set up in State plans, only in case the minimum qualifications of such teachers are fully equal to those specified in licenses to teach regular subjects in the public schools of the State. State boards are advised to make it a requirement that the teachers of nonvocational subjects shall have had, or shall be required to secure, sufficient contact with industrial activities to give them an appreciation of the conditions and problems of industry, and at least a layman's knowledge of the more common machines and processes found in the shop. Their knowledge of industry should be such as to enable them to gather teaching material in their subjects from the world of work, and to make practical application of the principles taught to the conditions and problems which the pupils, as citizens and as workers of industry, are sure to encounter. Whenever possible, teachers of successful experience in the regular public schools should be secured.

AGE OF TEACHERS.

Nothing has been said so far about an age qualification. There is a considerable variety in the proposals made by the several States. Twenty-one was the lowest minimum age selected by any State, but the Federal Board believes that there is rarely a case where a teacher of 21 years can have had a successful experience in the vocation he proposes to teach.

It may be said, however, that if a State board sets up the experience qualifications in its plan, as advised above, the matter of age will take care of itself, since it is hardly possible for a person who has served several years in his trade as an apprentice or learner, and at least three years as a successful journeyman or master workman, to enter upon teaching much under the age of 25 years.

Certain other qualifications than those mentioned above can not be measured in terms of years of experience or in age. They are difficult to enumerate, harder to define, and still harder to measure. The State board should reserve the right to approve or disapprove a teacher, on its judgment, concerning some of these indefinite qualifications, among which may be mentioned character, attitude toward the work, liking for young people, personality, and veracity.

II. THE GENERAL INDUSTRIAL SCHOOL.

Section 11 of the Federal act provides that in cities of less than 25,000 population according to the last preceding Federal census, the State board with the approval of the Federal Board for Vocational Education, may modify the conditions, as to the length of course and hours of instruction per week, for schools and classes giving instruction to those who have entered upon employment, in order to meet the particular needs of such cities and towns. This proviso makes it possible for the Federal Board to modify two of the standards given above under unit trade schools.

UNIT TRADE CLASSES DESIRABLE WHENEVER POSSIBLE.

A population of less than 25,000 is not conclusive evidence that a general industrial rather than a unit trade school should be established. Many smaller communities have predominant industries, and can support unit-trade classes which will meet real demands of the community. Wherever possible the unit-trade class should be organized rather than the general industrial class, because the former has a more definite aim, and a more specific and easily tested course of study for each trade, and also because teachers fully capable of conducting unit-trade courses are easier to secure and easier to judge with reference to their qualifications than are teachers for general industrial classes.

REASONS FOR ORGANIZING GENERAL INDUSTRIAL SCHOOLS.

In attempting to provide in its plans for the needs of industrial education in the smaller cities, the Federal Board has taken into account the last clause of section 11, "in order to meet the particular needs of such cities and towns." Many such places can not advantageously organize unit trade schools, that is to say, schools to meet the needs of persons who have made choice of a particular vocation. In many small cities it would be difficult to find a sufficiently large number of persons who have decided to enter any particular trade to justify the organization of a unit trade class, and usually, also, the cities would be unable to furnish employment to any considerable number who might be graduated from such a class from year to year. No vocational school of any sort should be established unless there is opportunity for entrance into employment of all who are trained in the school. Consideration should always be given to the supply of and demand for labor in the particular trade or industrial pursuit in deciding upon the establishment of classes. Since, however, the Federal law provides that day trade or industrial schools may be

established in the smaller cities to meet the particular needs of these cities, a more liberal interpretation must be given to the term "trade or industrial pursuit."

Under this interpretation a grouping of trades has been allowed in schools which have come to be known as general industrial schools.

A general industrial school is one organized to meet the needs of the industrial life of a community of less than 25,000 population, where full classes of a unit trades are inadvisable.

In planning the course of study for such a school, it is necessary to make a careful study of all the industries of the community, to pick out certain ones which offer the greatest opportunities, and to endeavor to give more training in each of these, with the aim of picking out from the different occupations such common elements as may exist. The instruction will be as specific as possible with the equipment and diversified aims, but will necessarily seek for common interests upon which to base its development. For example, in practically every trade or industrial pursuit a knowledge of drawing as related to that pursuit is advantageous, and the common element in the drawing of different industrial occupations is considerable. Consequently it is possible in the general industrial school to give a course in mechanical drawing which will prove of considerable value to the students who take it, no matter what industry they enter. It is true also, that the skill acquired in handling tools in any school shop will carry over to some extent into several occupations. A unit trade school will undoubtedly give more efficient instruction in any one trade, but by careful selection a teacher may sift from the unit trades various skilled processes that depend somewhat upon a basic ability of the worker to use his hands and his head for mechanical production. The several factors of approval as set forth in the preceding section for unit trade schools may be taken up to determine in what respects standards must be modified for general industrial schools.

CONTROLLING PURPOSE.

The controlling purpose of the general industrial school must be to fit for useful employment, but the Federal Board must define fitting for useful employment in the smaller cities as differing somewhat from the same preparation in the larger cities. In any classification of occupations it is necessary to recognize (1) trade groups, and (2) particular trades within groups. Even in the larger cities it would be possible to organize trade courses for occupational groups. Among the principal trade groups may be mentioned the metal trades, the building trades, the electrical trades, and the printing trades. Within the metal trades there are such well-recognized special trades as the following: Blacksmithing, machinist,

foundrying, tool-making, tool-dressing, heat treatment working, boiler making. Among the woodworking trades are: Pattern-making, wood-turning, planing-mill work. Among the building trades are: Plumbing, steamfitting, inside wiring, carpentry, bricklaying, concrete working, and sheet metal working.

Wherever possible in the smaller cities, the general industrial school should be built up around the occupations of a particular trade group. Within this the school should carry the pupil as far as may be done in the several trades, preparing him to enter as an intelligent learner in any one of them, but not fitting him to begin work in any one on a par with the unit trade school graduate. Probably in some of the smaller cities, especially those which are growing rapidly, and where much building is going on, it would be entirely possible to organize a general industrial school which would be built up around the two trade groups of woodworking and building.

The controlling purpose of such a school would be to prepare for entrance with advantage into one of the trades in the woodworking or building groups. This selection would be justified for the following reasons: (1) In the smaller towns and cities where trades are not segregated and highly specialized, it is common practice for workers to become skilled in more than one occupation. The builder must know something about mill work; he must be able to do some wire installation work; must understand bricklaying; must know something about cement work; and have some insight into plumbing. (2) There is a considerable common element in these trades although not a common content, which could be taught to advantage. Such a school would offer education which would enable the boy to enter the trades within a group with some knowledge which would be of value in almost any one of them, and some training that might assist him in any regular industrial occupation. Admittedly, however, the general industrial school can not be organized in a way which would give advantageous entrance into any one of a large number of groups, and would not be justified in organizing to give general education.

The controlling purpose of a general industrial school should be well-defined by the community which proposes to establish it, before a State board of education gives encouragement to the belief that any salary expenditures may be reimbursed from Federal funds. The general industrial school must develop only as it can show that it serves a genuine industrial need. The Federal Board frankly feels somewhat doubtful of the success of the general industrial school, especially where it is the only kind of secondary school in the community. The board can not see its way clear to approve a plan which sets up such a school where the instruction given in it

is a part of the work taken by all pupils in the regular school system. In other words, State boards must not provide in their plans, with an expectation of approval by the Federal Board, for assisting manual training or any form of practical arts which forms a part of general education. Although boards may take into account modifications as to character of work done, they must, nevertheless, be assured that the controlling purpose is to fit for useful employment.

To summarize, the authorities must first determine whether it is possible to secure a group of students who are honestly proposing to enter the industries for which they are to be fitted; second, whether it is possible to prepare these pupils effectively in a mixed group; third, whether the preparation so given will have sufficient specific trade training to permit students to enter the industries with advantage; and fourth, whether the town will be able to offer employment to the graduates from year to year.

All the above conditions are to be determined by constant and careful checking and follow-up work, to ascertain that the graduates really have been successful in securing employment and advancing in their various fields.

AGE OF ADMISSION.

The age requirement for the general industrial school is identical with that for the unit-trade school. The minimum age of entrance is 14 years, except as this requirement is qualified as indicated in the discussion of unit-trade schools. Also, no specific upper age limit is set, but the school is bound by the same conditions as those laid upon the unit-trade school.

NECESSARY PLANT AND EQUIPMENT.

All that has been said regarding buildings for the unit-trade school should be read again by those contemplating the establishment of general industrial schools. Although a building is suited to unit-trade work, it is not always equally as well suited to general industrial work. Usually the shop rooms in the latter are fewer in number, and should be differently arranged, so as to accommodate more than one trade equipment and possibly more than one teacher in the same room.

The plant and equipment should be of as great variety as possible, and should be selected with consideration for the various trades or occupations in the city about which the course of study is built. It is probable that there will have to be in the same shop, equipment from various trades within the same general group. The same precaution should be taken in selecting the equipment as is taken in the case of the unit-trade school, and the same care should be taken as to installation and safeguarding. The general industrial school

must in every case reflect the industrial life of the community. This and other points should be taken into consideration by the State board before it approves the equipment and plant, as it must do before certifying the work for Federal aid.

MINIMUM FOR MAINTENANCE.

Practically all that has been said on the subject of maintenance previously will apply here. The maintenance money must be adequate to carry on the activities, so as to fulfill the aims of the school, and the State board must assure itself that these funds are adequate before it certifies the school for approval. The State board may reject a school applying through its State board for Federal aid if the school lacks a proper maintenance fund in addition to any money used to match the Federal moneys.

CHARACTER AND CONTENT OF COURSES.

The same procedure is used in building up a course of study for a general industrial school that is followed in building up a course for a unit-trade school—that is to say, the occupations which the school is to serve must be analyzed in practically the same way in both cases, or recourse must be had to analyses of occupations which have already been made. Then follows, necessarily, selection of the processes and kinds of skill most advantageous for the learner to acquire, which can be taught well, despite the fact that these skills and processes are selected from several trades. There should also be selection on the basis of giving an experience which is common to the several trades.

It was stated above, under the discussion of the controlling purpose, that the Federal Board believed that a general industrial school could not be a part of a regular secondary school. In formulating a course of study this must be kept clearly in mind. If it is organized as a department in a building which houses a general secondary school, the department should consist of a separate body of pupils, teachers, and courses. In other words, there should be segregation of the group, and the course of study should be made with the needs of this segregated group in mind. Such a group is made up of persons who have decided to enter industrial work and have made their choice within the group or groups of occupations in which the school gives instruction.

In measuring the effectiveness of the general industrial school, the State board should be guided by the principles enumerated above for unit trade schools. (1) The pupils must be in the great majority of cases at least 14 years of age, and must have determined upon the vocation that they expect to pursue; (2) the course of study must be taken from the activities of the occupation itself as practiced in productive

plants; (3) the course must be of such a nature as to guarantee advantageous entrance into the vocation selected; (4) after the school has been organized for a sufficient length of time, its real aim and success should be measured by the number of persons completing the courses who have actually entered upon industrial occupations for which they were fitting.

Where general industrial school courses are so general that they fail to provide for entrance into specific trades; where all of the pupils in a community pass through these courses as part of a long system of general training; or where large numbers of graduates fail to seek employment in occupations for which the courses are proposed to prepare, the State board would be justified in rejecting the course of study and, therefore, the entire work of the school.

METHODS OF INSTRUCTION.

The methods of instruction in a general industrial school should aim to give a trade preparatory training as nearly like that of the unit-trade school as is possible under the conditions. There is more need for careful analysis of the different trades than in the unit class, because only a few of the important factors of any one trade can be presented in any case, and nonessentials must therefore be eliminated. There is more need for careful teaching methods, also since every process and type of skill must be presented so as to appeal to pupils interested in entering different trades.

The group and the individual method of instruction here again should be used; group instruction to present common factors, and general principles; individual work to apply these to specific trades and to supply specific examples. The group work should be planned with a wealth of concrete examples and problems relating to all the several specific trades represented. The methods here partake in their pedagogical features of those used in general education, whereas in the trade features they must follow the best methods of instruction used in teaching unit-trades, trades apprentices, and productive skill. The teacher must recognize these manifold requirements and prepare his work accordingly.

Exercises for producing skill and process knowledge may be used more frequently here than in unit-trade classes, but every exercise should relate to some specific project, contemplating a useful and complete product.

AT LEAST HALF-TIME TO PRACTICAL WORK.

Admittedly, work on a useful or productive basis can not be carried on to the same extent as in the industrial school or class in the larger city. The number of operations to be taught, the variety of trades in which experiences must be given, the importance of securing

commercial equipment for each of the trades taught, lack of experience on the part of the teacher in many of the trades, render production of output in various lines of standard products more difficult than it is in a shop completely equipped for each particular trade. This is all the more true when we add on the side of the unit-trade school, a teacher of great experience in the trade which is taught, who is given additional time for production work.

However, the work which is given in the shops of the general industrial school must be of such a character as to provide a usable product as far as possible. Certainly, the project method should be used whenever possible. The work of the classes should lead to the completion of a definite task in which the accomplishment by a group involves trade processes of commercial value, related to the industries found in the community, and included in the trade groups under consideration. (See statement under unit-trade schools.)

DURATION OF COURSE.

Instruction may extend over less than nine months per year. The board has approved in many State plans the provision that schools might be in session in the smaller cities for less than nine months. Usually, however, the States themselves have preferred to keep nine months as the standard length of year for these schools. The Federal Board would not approve, in any State, a shorter session of school than that provided by law as the minimum number of weeks which the common schools must be in session in a given year,

HOURS OF INSTRUCTION.

The law also leaves to the Federal Board power to modify for general industrial schools the 30 hours per week required by unit-trade schools. Plans which have presented modifications in this regard have usually arranged to have schools of smaller cities in session approximately the length of the regular school day, ordinarily five hours. In no case has less than a five-hour day been approved. The Federal Board believes, however, that it would be advantageous in the smaller cities to have at least the minimum of six hours, as provided for in the larger cities.

QUALIFICATIONS OF TEACHERS.

Since there are practically always several trades in which instruction is given, it is very difficult to secure a teacher with an adequate experience in each of the trades. There are two possible modifications as to the qualifications of teachers as given for unit-trade

schools, which can be made in the case of general industrial schools:

(1) A teacher may be selected who has had adequate experience in one of the trades, and a satisfactory contact with each of the others which are to be taught. That is to say, he should be master of one, and have had actual experience in handling the others. It is not impossible to find in the smaller cities and towns men who have dealt with the materials and processes of several industrial occupations. (2) Graduates of technical classes or schools which have been preparing general industrial teachers may be employed. There are a number of institutions which have been preparing industrial teachers and giving them a preparation in a variety of industrial activities. A graduate of one of these schools, with a satisfactory teaching experience and contact with industry, may render excellent service as the shop teacher of a general industrial school.

Related-subjects teachers may have the same qualifications as are noted above, or the same as have been specified for unit-trade school teachers. Actual trade contact, sympathy, and appreciation of industrial production and all that it involves are indispensable to the teachers in these schools.

NOTE.—When a unit-trade class is organized in a city of less than 25,000 population modifications may be made as to length of term and hours of instruction per week.

Part III. PART-TIME SCHOOLS OR CLASSES.

SPECIAL PROVISION FOR PROMOTION OF PART-TIME INSTRUCTION.

In providing for part-time schools or classes, the Federal act aids States in promoting education of various kinds for persons over 14 years of age who have entered upon employment and are released, during regular working hours, for instruction purposes. In any State undertaking part-time education there are available as possible pupils, the large number of minors who have left school at the earliest age allowed by law and have entered upon employment. In some of the States there have been established part-time schools either compulsory or permissive. In every State plan submitted to the Federal Board there has been provision for part-time schools, and in every State at least one-third of the fund for trade, home economics, and industrial education must be spent, if spent at all, in part-time schools.

It is evident from this restrictive provision that Congress believed that this form of education needed most promotion. Section 11 of the act provides education for persons over 14 years of age who are preparing to enter upon the work of a trade or industrial pursuit or who have entered upon a trade or industrial pursuit, and makes it obligatory upon any State accepting the fund for trade and industrial education to spend at least one-third, if that third is to be spent at all, in part-time schools or classes. It provides further that subjects in part-time schools or classes may mean any special subject given to enlarge civic or vocational intelligence.

RULINGS OF THE FEDERAL BOARD ON PART-TIME INSTRUCTION.

For the purpose of encouraging the rapid development of part-time education and increasing the number, variety, and enrollment of part-time classes, the Federal Board has recently made some important rulings concerning section 11 of the Federal act. These rulings became effective July 1, 1918. The part of the section referred to reads as follows:

That at least one-third of the sum appropriated to any State for the salaries of teachers of trade, home economics, and industrial subjects shall, if expended, be applied to part-time schools or classes for workers over 14 years of age who have entered upon employment, and such subjects in a part-time school or class may mean any subject given to enlarge the civic or vocational intelligence of such workers over 14 and less than 18 years of age; that such part-time schools or classes shall provide for not less than one hundred and forty-four hours of classroom instruction per year.

Stimulated by a desire to meet the needs of a large group of workers who are entering upon employment without adequate preparation, as well as of those already at work, the Federal Board passed the following resolution interpreting the phrase "who have entered employment":

Where persons definitely scheduled for employment in a trade or industrial occupation, by a written agreement with the employer are given before being employed instruction in a class fitting them for advantageous entrance to such trade or industrial occupation, such class may be considered as a part-time class and Federal moneys may be used for its support, under the provisions of section 11 of the vocational education act.

Such classes may also be open to those already employed, who may receive better preparation in the occupation they are already following, or promotional training for a new occupation.

Note 1. Such part-time classes may be carried on at the school, in the shop, in classrooms adjoining the shop, in a building near the shop, or elsewhere.

2. The instruction may be either manipulative in processes, or related to processes, or both.

3. Reimbursement may be made from Federal funds for one-half the salary of the instructor employed in this work, including the coordinator.

4. The course may be given once, twice or more times each year, or may be operated continuously.

5. The scheme of training adopted must establish the presumption at the outset that it will give advantageous preparation for or advancement in the occupation in which each pupil is to be employed.

The following resolutions were adopted by the board from a broad point of view concerning the meaning which could be legitimately given to the phrase "and such subjects in a part-time school or class may mean any subject given to enlarge the civic or vocational intelligence of such workers over 14 and less than 18 years of age":

1. Federal moneys may be used in part-time schools and classes for the salaries of instructors in trade, home economics, industrial, commercial, and general education subjects, as provided hereunder.

2. Such part-time classes must be classes which divide the working day or school time between instruction and practical work in shop, factory, home, office, etc.

NOTE.—To divide means here not to separate the working day and school time into two equal parts, but to apportion or distribute the total working day so that a portion of it is given to school instruction; or to apportion or distribute the total school time so that a portion of it is given to employment in shop, factory, home, or office, etc.

3. The subjects taught must be such as are designed to "increase the civic and vocational intelligence of the pupil."

4. Federal moneys may be used for the payment of the salary of an instructor only in cases where it is shown that the cost of such an instructor represents an addition to the expenditures of the school system incurred because of the operation of such part-time classes over and above expenditures for regular classes.

5. Where such part-time pupils are taught in a regular day class already established so that the class does not represent an additional cost to the school system Federal moneys may not be used for the salary of the instructor of such a class.

6. Part-time schools or classes may be operated for persons over 14 years of age, without upper age limit, provided that the instruction given is designed for and suitable to enlarge the civic or vocational intelligence of workers over 14 and less than 18 years of age.

7. In the plans from the States two general groups of teachers shall be recognized and qualifications set up for under part-time schools or classes:

(a) Teachers or subjects designed to enlarge the civic intelligence.

(b) Teachers of subjects designed to enlarge the vocational intelligence.

In case of teachers in group (b) qualifications shall be set up for each separate line of vocations, namely, trade and industrial, commercial, and home economics, or other vocational lines in which instruction is to be given.

All classes must be organized according to the following provisions:

First, that the class is under public supervision and control;

Second, that the controlling purpose is to fit for useful employment;

Third, that all instruction is of less than college grade;

Fourth, that the instruction shall be for persons over 14 years of age;

Fifth, that every dollar of Federal funds expended for salaries of teachers is matched by a dollar of State or local money, or both;

Sixth, that the class provides for not less than 144 hours of instruction each year; and

Seventh, that all the other requirements of section 11 of the Federal vocational education act must be observed.

TYPES OF PART-TIME SCHOOLS OR CLASSES.

In the provisions of the act three types of part-time schools or classes are clearly indicated:

1. Schools or classes for those who have entered upon employment giving instruction in the trade or industrial pursuit in which they are employed. (Trade extension part-time schools or classes.)

2. Schools or classes for those who have entered upon employment who wish to fit themselves for a trade or industrial pursuit other than that in which they are employed. (Trade preparatory part-time schools or classes.)

3. Schools or classes giving subjects to enlarge civic and vocational intelligence, i. e., to extend general education or to help in the choice of a vocation. (General continuation part-time schools or classes.) See rulings given above for part-time instruction in other vocations than trade and industrial.

The general characteristics of these three types of schools are summarized in the accompanying chart.

Chart of difference and similarities in the three types of part-time schools.

Kind of school.	Trade extension.	Trade preparatory.	General continuation.
Controlling purpose.	To supplement daily work.	To prepare for a trade or industrial pursuit.	To extend and supplement general education.
Age of admission and maximum age.	Entrance, 14 years. No maximum.	Entrance, 14 years. No maximum.	Entrance, 14 years.
Necessary plant and equipment.	Varies according to trade or industry; may be small in case work is related subjects.	Must approximate that used in industry.	Usual classroom and laboratory manual training.
Minimum for maintenance.	Variable.	Variable.	Variable—Least cost of three types.
Character and content of courses of study.	Supplements daily work. Depends upon individuals.	Experiences from vocations studied.	Subjects to enlarge civic and vocational intelligence.
Length of course.	144 hours a year. Minimum.	144 hours a year. Minimum.	144 hours a year. Minimum.
Qualifications of teachers.	Master of trade or technical subjects or both.	Master of trade or technical subjects or both.	Teacher of experience in elementary or high school with appreciation of industry.
Aim for pupils.	To better fit for employment in work now engaged in.	To learn a trade while engaged in some other occupation.	To add to general education.

PART-TIME INSTRUCTION A SOCIAL COOPERATIVE ENTERPRISE.

Unquestionably the feature of part-time schemes of instruction which makes such schemes of immense popular interest and of far-reaching social value is their dependence upon cooperation between schoolmen, employers, and laborers; that is to say, upon cooperation which is in the largest sense social and which embraces the entire population.

Part-time education is a community enterprise, embracing, directly or indirectly, nearly every phase of community life and welfare. Every element of the wage-earning population may enter into this cooperative enterprise. The only definition given to the scope of the work is that marked out by the needs of workers themselves, either for more schooling in general, or for special vocational training in preparation for entrance into a trade, or for promotion within a trade already entered upon.

These schemes provide for the worker's opportunity for continuous improvement, and open up to him the way of continuous advance in proportion as he acquires new trade skill and efficiency and new capacities for citizenship. They bring the teacher into the shop

and the worker into the school. They make education what it should be, a life-long process of developing new efficiencies. The worker does not leave school to enter the shop. He is graduated into the shop, where his wage work becomes a practical basis for continuing his schooling.

In the field of part-time instruction clearly lies the great opportunity for schoolmen and for employers, as initiating agencies, to promote the welfare of every class of workers, the opportunity to extend the public school system to embrace the whole community, and to make education a dynamic social force working for the general improvement of our whole citizenship.

I. TRADE EXTENSION PART-TIME SCHOOL OR CLASSES.

CONTROLLING PURPOSE.

Classes organized for persons over 14 years of age who have entered upon employment in a given trade or industrial pursuit, to be considered trade extension classes, must give work which will lead to promotion and advancement in that trade or industrial pursuit. Several assumptions are made in stating the purpose of a trade-extension part-time school or class, namely:

(a) That the persons who are to take the work are employed in a trade or industrial pursuit which has in it a content which can be given to advantage in an organized school or class.

(b) That there are opportunities in the trade or industrial pursuit for promotion and advancement.

(c) That the persons employed in the trade or industrial pursuit are to be given opportunities for experience which will enable them to use to advantage knowledge and skill acquired in the school or class.

The controlling purpose of classes thus recruited must be to fit members for better employment in the given trade or industrial pursuit in which they are already employed.

AGE OF ADMISSION.

Fourteen years is the minimum entrance age for persons who are taking part-time instruction. The age standard set up for part-time instruction is absolute and definite, as regards minimum age of entrance, and in this respect it differs somewhat from the standard set up for all-day schools. The provisions of the act may be read in combination, as follows: That such education shall be of less than college grade and shall be designed to meet the needs of persons over 14 years of age * * * who have entered upon the work of

a trade or industrial pursuit, but the funds which pay the salaries of teachers in part-time schools or classes shall be applied to part-time schools or classes for workers over 14 years of age who have entered upon employment. In other words, pupils may be admitted to day industrial schools who are not 14 years of age provided it can be clearly shown that they are fully able, from the point of view of physical fitness and mental attainments, to carry on the work "designed for" pupils over 14. This statement is not to be taken as meaning that the Federal Board approves the admission of persons under 14 years of age in the all-day schools or classes, but rather to show the differences between the absolute standard set up in the case of part-time education and the qualified standard set up in the case of all-day schools.

Every study of the employment of young people between the ages of 14 and 18 who have gone to work shows that very few children in the ages of 14 and 15 years are employed in occupations which can be said to be trade or industrial pursuits of such a nature that it is advisable to give for them trade extension work. Every part-time school or class should give particular attention to the employment in which its pupils are engaged, and should aim to help them to secure while remaining in the employment such promotion as is possible, but in part-time trade extension work, pupils must be recruited from trades and industrial pursuits having a content which can be taught. Attention is here called to the aims and controlling purpose of the general continuation school described below, which provides opportunity for workers to secure promotion in the semi-skilled and unskilled work in which they are engaged, and which also provides opportunity for helping individuals engaged in these lower grade occupations to make wise vocational choices. Since workers in the ages of 14 and 15 years are usually engaged in occupations other than trade or industrial occupations, or in low-grade industrial pursuits which do not require a long period of specific training, it is evident that usually the entrance age upon a part-time trade or industrial course will be considerably in advance of 14 years. As a matter of fact, in occupations recognized as skilled trades and industrial pursuits apprenticeship is generally not begun until the age of 16.

NECESSARY PLANT AND EQUIPMENT.

The Federal Board, in Bulletin No. 1, pointed out that it was impossible at the time the bulletin was written to establish absolute or quantitative standards with regard to the minimum plant and equipment which would be required in any type of vocational school.

If the local community providing trade extension part-time education is to meet a real need it must carry the part-time education to the places where it can be given most advantageously to the persons who have entered upon employment. Since trade extension work, both evening and part time, is to be supplemental to the daily employment, it is evident that it will be possible in many cases to give instruction in the plant where the workers are customarily employed. Through cooperation with employers, it is possible, therefore, to secure adequate equipment for part-time work at little or no expense to the community.

In setting up a part-time plan, a study should be made to determine the most advantageous place for location of the school or class, whether in a school building, or in a plant, or in a room hired for the purpose, or in an association hall, or in rooms of chambers of commerce, or elsewhere.

Much of the part-time instruction supplemental to the daily employment may be given in what are called related subjects, such as drawing, science, mathematics, and in the case of these subjects an elaborate equipment is not required.

The equipment necessary for a part-time school or class depends entirely upon the group which is to receive instruction, the character of the course of study which has been determined upon, and the methods of instruction adopted. Since the policies of the Federal Board recommend that the State board shall require communities to state the aims of part-time schools or classes, it will be possible for the State board to determine for individual schools whether the equipment which is proposed is sufficient to carry out the declared aim.

MINIMUM FOR MAINTENANCE.

Work in a part-time trade extension class is comparable to work in a trade extension evening industrial school. If any shop work is to be attempted, it must be given under conditions similar to those obtaining in the industry itself, and must be given by teachers who are thoroughly prepared through an extended experience in the vocation which they are teaching. These two conditions determine in a measure the amount of funds necessary for adequate maintenance. State boards of education should make certain that the funds which are available in any particular community for the support of part-time schools or classes are sufficient to secure properly qualified teachers and an adequate supply of materials. If State boards set a minimum in the case of trade extension part-time schools or classes, the minimum should be set upon the session basis rather than the annual basis.

CHARACTER AND CONTENT OF COURSES.

Bulletin No. 1 enumerates among the benefits which may be conferred upon wage-earning boys and girls two which refer to trade extension work: (a) Increased skill or knowledge in the occupation which the wageworker is following; (b) skill or knowledge leading to promotion in the industry or calling wherein the wage-worker is engaged. Since instruction here, as in the evening school, is supplemental to the day employment, it is evident that the course of study must be based upon an analysis of the trade, and that the needs of the specific group to be instructed must be always in mind. As is pointed out elsewhere, analysis of various occupations can be found in a number of the surveys, notably in those published by the National Society for the Promotion of Industrial Education, for Richmond and Minneapolis, and in the State Vocational Survey of Indiana. The United States Department of Labor also has published bulletins giving analyses of trades; and the Federal Board for Vocational Education in its War Emergency Training Bulletins (Nos. 2, 3, 4, 7, 8, 9, 10, 11, and 12) furnishes information valuable to school authorities attempting to formulate short unit courses of study. Attention is here called to the consideration of the subject of courses of study for evening classes, which under the act are all of them necessarily trade extension courses. (See pp. 97 to 100.) While principles set forth for evening classes may be followed in detail for part-time extension courses, one modifying condition may be noted. Since attendance in a trade extension part-time school is usually more regular than it is in an evening trade extension school, the part-time course may be planned to cover a longer period in a given topic, and the sequence of short courses may be arranged covering a definite number of hours a year with considerable assurance that the group will be in attendance during the entire period.

In making up a course due regard should be given to the special requirements of the two general types of work, namely, shop work, which implies actual manipulation of machines and materials, and related-subjects work, which gives the related drawing, science, and mathematics inherent in the trade or industrial pursuit in which the pupil is engaged.

As is true of plant and equipment, and minimum for maintenance, the course of study for any community should receive individual approval.

Valuable service may be rendered by advisory committees in formulating courses.

METHODS OF INSTRUCTION.

In a part-time school methods of instruction different from those of an all-day school should be employed. They should obviously be adapted to time limitations. Time available for instruction varies commonly from four hours a week to half-time, as, for example, in the week, about part-time plan. Where a few hours a week only are available the school will have to depend almost entirely upon the practical experience secured in the employment itself for the apperceptive basis of instruction. In proportion as more time is available, methods of instruction used in the all-day schools may be approximated.

In general, the methods of instruction should be those used in the best commercial concerns in training workers. Since part-time trade extension instruction undertakes to supplement systems of apprenticeship, and to provide a substitute where systems of apprenticeship do not exist, the methods of instruction must be taken from the trade or industrial pursuit itself.

HOURS PER YEAR.

Part-time schools or classes must provide for not less than 144 hours of instruction per year. By hour is meant a period of 60 minutes, the clock hour being intended rather than the shorter recitation or study period sometimes called by schools an hour. This requirement of the act fixes a minimum standard absolutely. The act does not designate any maximum number of hours. Length of session in part-time schools may, therefore, vary from the lower limit of 144 hours per year, to the lower limit of hours of instruction per year in all-day trade or industrial schools, namely, nine months, or 36 weeks of 30 hours each. In practice, however, not many part-time schools will be organized to give instruction for more than half the minimum number of hours provided in the law for all-day schools.

TIME SCHEDULES.

Some arrangements of time schedules to cover the minimum of 144 hours are the following:

(a) Four hours per week for 36 weeks per year. This is a feature of the organization of many part-time schools, both voluntary and compulsory.

(b) Eight hours a week for 18 weeks a year.

(c) One hundred and forty-four hours per year in any sequence as to number of hours per day, hours per week, or weeks per year.

(d) The dull season. For example, a part-time class for carpenters' apprentices during January and February in Northern States where building operations are practically suspended in these months.

Part-time instruction need not, however, be restricted to 144 hours per year. It may, on the contrary, very considerably exceed this number of hours. Where the minimum is exceeded the following additional variations in the time schedule are possible:

- (e) Half-day in school and half-day in industry.
- (f) Day in school and day in industry, or the alternate day plan.
- (g) Week in school and week in industry.

Other arrangements of time schedules are of course possible, and other arrangements will receive careful consideration by the Federal Board. The variables of the time schedule, relate both to (1) total number of hours of instruction per year, and (2) distribution of this total by days, weeks, months, and years.

The local community which is undertaking to provide part-time education should endeavor to arrange that the instruction shall be given at such times as will be convenient for pupils, and for their employers.

A bulletin in preparation by the Federal Board will undertake a full discussion of a program for compulsory part-time education. When a State enacts compulsory part-time education there will usually be included a provision as to number of hours. The present minimum number of hours per week is 8 in the two States that have compulsory laws, extending from the age of 14 over the minimum term required for elementary schools in those States.

In considering time schedules, the distinction between part-time work and evening school work should be kept in mind, namely, that evening schools are organized to give instruction to pupils who are employed, but to give it at times outside regular hours of employment; while part-time schools are organized to give instruction during the regular hours of employment, the worker being released for attendance upon the part-time class.

It is necessary that this distinction be carefully observed, since it is only in the latter kind of school that one-third of the fund for trade, home economics, and industrial education can be expended if spent at all.

QUALIFICATIONS OF TEACHERS.

The two types of teachers in trade extension part-time work, namely, teachers of shop work and teachers of related subjects, may be separately considered.

(a) The shop teacher in a trade extension part-time school or class should have had as much experience in the trade as should the teacher in an all-day trade or industrial school or in an evening school. In general this should not be less than three years' successful experience in the trade under commercial conditions. It

is difficult to set up absolute standards as to vocational experience, and the term three years is suggested here to safeguard against any tendency to employ as shop teachers persons who do not know the practices of the trade in which they are giving instruction.

When a State has set up a scheme for teacher-training, it will have means by which it can more adequately judge the qualifications of persons who are candidates for appointment as shop teachers.

(b) The teacher of related subjects should have a thoroughly practical knowledge of, and experience in, the related drawing, science, and mathematics for which he is responsible. Graduation from a technical high school should not be allowed as a substitute for the real contact of actual employment.

In most of the plans approved for the year 1917-18 little distinction was made between the qualifications of the related subjects teacher in a part-time school and those of the related subjects teacher in an all-day trade or industrial school. It will be evident, however, that more practical work should be required in the case of the related subjects teacher in part-time instruction. In other words, the requirement of the formal education such as is given in a technical school or college is less, and the requirement of practical experience is greater in part-time work. It is fairly well agreed that in the case of all-day schools the ideal teacher to secure is one who is able to teach both the related subjects and the shop work, and the effort should be made to secure such teachers also for part-time trade extension work.

In all forms of part-time education the teacher's personal ability to influence for good boys or girls of rather immature age must be taken into careful consideration.

II. TRADE PREPARATORY PART-TIME SCHOOLS OR CLASSES.

CONTROLLING PURPOSE.

The second type of part-time school recognizes the necessity for giving vocational education to immature workers who have left school at an early age, and who have many times entered upon unskilled low-grade employments providing few if any opportunities for advancement.

Evidently these pupils can not be cared for in trade extension classes, and they should not be left to wander around aimlessly from job to job. Many of these boys and girls are employed in "blind alley" occupations, such as carrying messages and running elevators. It is possible under the provisions of the Federal act to organize a part-time school or class which will fit them for a really desirable trade or industrial pursuit.

The controlling purpose of instruction for such workers differs but little from that of the all-day school or class, but the work must be given under different conditions, since it must be assumed that the energy and time of the pupil will be largely absorbed by the day employment. Here, as in the previous type of part-time instruction, the law intends these schools and classes to "better" fit pupils for useful employment or to fit minors in the blind alley jobs for "better" employment. The employment chosen and the time allotted to instruction must permit a realization of one of these ends, and before a trade preparatory part-time school or class is organized certain questions must be answered, among which the following may be noted:

1. Is the time available sufficient?

Time available is a matter of paramount importance in the case of classes preparing for entrance to a trade. Here the entire trade and technical preparation must be given in part-time classes, and the daily employment of the pupils can not be depended upon to assist in any appreciable degree. The pupils should therefore be employed where they can have sufficient time off each day or each week to attend regularly upon instruction, and upon enough instruction to insure a real trade preparation in a reasonable period. As is shown in the case of evening schools, to attempt preparation for a highly skilled trade by giving instruction a few hours per week is impracticable. Certainly not less than eight hours per week should be devoted to part-time trade preparatory work, if it is undertaken at all.

2. Are there occupations in the community which can be taught in the time available?

The occupations taught must be either simple enough to be learned in, say, 30 to 60 weeks of part-time instruction—such as riveting, calking, or machine woodworking—or they must be capable of division into distinct units, each a part of the whole trade in any one of which sufficient skill will insure steady employment. Thus the occupation of lathe hands, turret machine operators, ignition and battery repair men, are divisions of the machinists and automobile mechanics trades in which men who are not all-around high-grade mechanics are employed.

3. Is the number of workers over 14 years of age who wish to prepare for any given occupation, sufficient to justify organization of a class?

That there must be a real need for the work before it is started is self-evident. A survey of the community should be made to determine the number of persons over 14 years of age engaged in occupations not warranting trade extension work, but eligible for better training in trade preparatory classes.

4. Can arrangements be made to give instruction in cooperation with industry?

It must be shown that there are places properly equipped for the work and properly located, and that arrangements for cooperation can be made between employers, employees, and school authorities.

5. Can the courses be arranged to give instruction and background sufficient to insure advantageous entry into the chosen pursuit?

The controlling purpose of all part-time schools other than trade extension classes draws its inspiration from the law specifying "increased civic and vocational intelligence," and while this refers most particularly to the third type of part-time work, that part of it regarding increased vocational intelligence allows, as one aim, a new vocation. The aim and purpose of each class, however, should be clear, and the aims of the school should be few and distinct, not conflicting or hazy. Primarily the aim of each class should be to make possible for each pupil entrance into a better occupation than the one in which he is employed.

AGE OF ADMISSION.

As in all other part-time classes no pupils may be admitted under 14 years of age. The difference between the minimum age provision for part-time classes, and that relating to all-day schools has already been pointed out—that, whereas certain pupils under 14 may enter all-day classes, no pupils under 14 may register in part-time classes.

No upper age limit is specified for pupils in part-time trade preparatory classes.

NECESSARY PLANT AND EQUIPMENT.

Much that has been said concerning plant and equipment for trade extension classes applies equally well in trade preparatory work. No absolute standard can be set up for all communities. The varying size of classes, and varying character of the work, make a flexible standard necessary.

It may be pointed out, however, that the equipment in a trade preparatory school must, in most cases, be larger, more complete and more nearly like that of the commercial shop than is the case in other part-time work. Actual commercial shop work must be done, and the pupils' day work can not supply contact with tools and machines, comparable with that of trade extension pupils. Moreover, related subjects, which require less equipment, form a smaller part of the trade preparatory course of study.

What has been said regarding buildings for the trade extension type of school, applies also for this type, except that it is much more necessary to have the school located near the places where the pupils are employed. Proximity to place of employment is important

because the pupils in these classes should come oftener to the school than trade extension part-time pupils, and should waste a minimum of time going and coming. To make such provision will, however, frequently be difficult because the pupils of any given class will seldom be found working under one roof or even in close proximity, as is often true with trade extension students.

MINIMUM FOR MAINTENANCE.

Little more need be said regarding this topic than has already been said under this heading for trade extension classes. Variations for maintenance must be expected, the one indispensable rule being that the State board shall assure itself before approving any work that ample maintenance money will be forthcoming.

The cost of conducting trade preparatory classes will in most cases be more per pupil-hour than that of other part-time instruction. The need of approximating commercial shop conditions calls for productions, and consequently for more material per pupil. More light, heat, and power, also, will be required than is usual in other forms of part-time work. This increased cost may be to some extent offset by the product.

CHARACTER AND CONTENT OF COURSES.

Instruction must be designed to meet the needs of persons over 14 years of age who have entered upon employment.

This is the one absolute restriction common to the courses of study of all part-time instruction. Much of the comment made regarding courses for trade extension classes will be useful to those who are contemplating courses for trade preparation work. The all-day trade preparatory school also furnishes many suggestions valuable for the same work in part-time classes.

It may be noted that since the pupils are unfamiliar with the simple and fundamental manipulative processes of the employment to be learned, the related subjects will naturally be taken up late in the course and will occupy a place of secondary importance. Actual trade or industrial productive work must come first.

For this reason and because of the limited time, the course of study must contain only the matter of greatest importance and value to the learner. The long, exhaustive, and detailed courses of the all-day schools can not be transplanted to the part-time schools. Instruction specifically of importance for immediate entry into the trade must form the nucleus of the course. It is evident, therefore, that this sort of part-time instruction must be largely individual. The community which is endeavoring to meet the needs of these part-time pupils must make a careful analysis of the occupations and must limit the instruction to such subjects as will enable the worker to secure entrance into the trade or industrial pursuit which he desires to follow.

The trade preparatory class, however, is in no sense a vocational guidance class, as the general continuation class may be, but is intended to fit for a definitely selected occupation. As has been pointed out the course must be for semiskilled occupations rather than for skilled trades, and it must be designed not only for minors but also for pupils of maturity and of considerable preliminary education. All of these things depend to such an extent upon the aim of the particular class that no uniform course of study can be formulated for any large number of schools.

Attention should also be called again to the references in previous sections of this bulletin regarding courses of study, as presented in the reports of surveys from various States and cities and in the bulletins of the Federal Board. The part-time courses conducted by the University of Cincinnati, in cooperation with industrial establishments, offer valuable suggestions and material in the analysis of machine operations for instruction purposes. Besides these helps the advice of committees of practical employers and employees is again recommended.

METHODS OF INSTRUCTION.

Trade preparatory school pupils constitute a distinct group with the following general characteristics in common:

1. *Adolescent age.*—Between 14 and 16, or 14 and 18, pupils must be treated as adolescents, not as children, and classes of more mature pupils must be organized separately to insure best results.

2. *They are not naturally interested in learning from books.*—While many leave school for economic reasons, the majority leave because formal school work does not appeal to them. They must be approached through actual trade processes and activities and through their interest in advancement.

3. They are ambitious if not compelled to attend by State laws. The fact that they are dissatisfied with their present employment and are seeking entrance to a better one affords a fine method of approach to their interest in instruction.

4. They respect trade proficiency in their teachers, but look down upon those who can only talk. Teachers who give actual demonstration for any principle or process, who are thoroughly familiar with trade terminology, methods of expression, materials of the trade, prices, use of formulas and shop procedure, possess a basis of knowledge upon which to build a satisfactory teaching method for trade preparation.

5. Time for trade preparation is short. Important principles must be explained to the pupils in groups; demonstrations must be given at carefully selected points in the course and given to groups. Most

of the other instruction will be individual, and will deal with minor points, developing the pupils capacity to do for himself rather than showing him how or telling him facts.

HOURS PER YEAR.

These classes, like all other part-time classes, must be in session for not less than 144 hours in the 12 months, July 1 to June 30.

Thus the part-time trade preparatory class may make all the different distributions of time through the year previously allowed and suggested for trade-extension instruction, provided the total is not less than 144 hours actual instruction during the year and not more than one-half of the total working day prorated through the year. A student who spends more time in instruction during the year than he spends actually working in industry can not be considered a part-time student.

QUALIFICATIONS OF TEACHERS.

The trade preparatory teacher should be the highest type of teacher obtainable for the work. He must have adequate trade experience—enough not only to enable him to practice the trade and to teach it, but enough to analyze his trade for teaching purposes, picking out the most important points and processes in a good teaching sequence, and selecting proper projects for teaching these essentials in the least possible time. At the same time he must manage a productive shop according to trade standards.

Trade preparatory classes need both shop teachers and related-subjects teachers. Shop teachers are the ones more particularly referred to above. Related-subjects teachers, though fewer in number, are equally important because of the fact that so little time can be allowed for that work. The teacher must not only know the related subjects thoroughly, know how to teach them properly, but must have more actual experience in the trade than any other related-subjects teacher, because he must interpret each subject in relation to its practical value in the trade and then select the most indispensable points for instruction purposes. No school trained man or manual training man without somewhat extended experience in industry should attempt to handle this work.

In addition we may repeat the general qualifications cited for other teachers, such as interest in young people, familiarity with conditions under which they are working, ability to inspire interest, willingness to visit and study industrial plants, patience, and a desire to serve others.

III. GENERAL CONTINUATION PART-TIME SCHOOLS OR CLASSES.

CONTROLLING PURPOSE.

The aim of the general continuation school or class has been fairly well set forth in the definition of such a class at the opening of the discussion on part-time schools. Their purpose is to extend and supplement the general education of the pupil from the point where he left the common school.

As has been noted, these schools and classes draw their inspiration from that provision of the act which declares that "subjects in a part-time school or class may mean any subject given to enlarge the civic or vocational intelligence of workers who have entered upon employment." In accordance with this provision, the Federal Board has made the following announcement of principals and policies:

In general Federal moneys may be used to pay the salaries of teachers employed in those part-time schools or classes where wage-working boys and girls receive any or all of the following benefits:

* * * * *

(c) Improvement in the knowledge of regular subjects which the wage-worker did not complete in school.

(d) Increased civic or vocational intelligence.

(e) Skill and knowledge in home economics for girls employed as wage-workers.

The general continuation class is established upon the assumption that the pupil in his efforts to succeed in any occupation is handicapped by lack of general education, and that it is a duty of the State to provide such education in part-time classes, as a means of overcoming this handicap. It is assumed, also, that a worker may need instruction intended to increase his general vocational intelligence, such as may not properly be comprehended in any program of strictly trade-extension instruction. Finally, it is assumed that a good workman must be a good citizen and that making him such is one legitimate end of part-time instruction.

AGE OF ADMISSION.

As in all part-time school work, 14 years is the minimum entering age.

It was evidently the intention of Congress to provide for two types of part-time instruction:

(1) For persons who have entered upon or who are preparing to enter upon a given trade or industrial pursuit.

(2) For persons who have entered upon an employment who need further instruction in subjects giving civic and vocational intelligence.

It is only in this provision for instruction in part-time schools or classes in subjects given to enlarge civic or vocational intelligence that the Federal act recognizes as being eligible for reimbursement any kind of instruction which may be classed as general education.

Pupils in attendance upon general continuation schools will usually be in the ages 14 and 15 years while trade extension part-time pupils will generally be more mature—16 to 18 or older—since entrance upon a trade or industrial pursuit which requires a period of apprenticeship or preliminary training is commonly deferred until the age 16 or after that age.

NECESSARY PLANT AND EQUIPMENT.

The plant and equipment for general continuation part-time work is easier to provide and less expensive than in the case of the other types of part-time schools and classes. The fact that machinery and apparatus is seldom needed makes the expense small. Use of regular classrooms in school buildings is entirely feasible, and since grammar-school buildings are pretty generally scattered in communities, it is possible to form classes near places of employment or workers' homes.

Often in cooperation with employers, school rooms can be equipped in stores, factories, and other places where large numbers of immature children are employed, making it possible for children who are to attend these classes to take the work with the least possible expense of time either to the pupils themselves or to their employers. The State board, however, should reserve the right to refuse to approve any building or room for part-time classes, if it is found to be unsuitable.

The equipment will consist mainly of seats and desks suitable for pupils over 14 years of age, of blackboards and wall space for charts and maps, of reference and textbooks, and of general equipment found in public schools.

Textbooks must be selected with especial care, since the usual textbooks on arithmetic, history, and science contain too much material for basal texts in these classes. Text references and shop equipment as well should be selected with a view to providing opportunity for young people to learn something about the dominant industries of the country. The number and variety of books available for reference and class use should be larger than is ordinarily found in elementary or secondary schools, since selections must be made from many different texts in order that the work may meet the real needs and interests of the pupils.

Some other equipment, also, will be needed, in the nature of shop cards, time-clock cards, pieces of material, and cuts of tools, for practical demonstration of industrial methods. This sort of equipment can generally be borrowed or purchased at slight cost from the manufacturing plants in the community. Where general science is needed preceding trade-extension work in related science, the general chemistry, physics, mechanics, and biology equipment of the high school may be needed for part-time classes. It is exceptional, however, when such science equipment as is needed can not be sent to any grammar-school building and used there for those special classes. Selection of equipment must, of course, depend upon the size of the class. For effective work it may be noted small classes are well-nigh imperative.

Since the policies of the Federal Board recommended that the State board should require communities to state the aim or aims of part-time schools or classes, it will be possible for the State board to determine in individual schools that the equipment which is proposed is sufficient to carry out the declared aims.

MINIMUM FOR MAINTENANCE.

Having before them the aim and purpose of a part-time continuation class and the equipment to carry out the aim, the local community can not go far wrong in estimating the amount of money needed to maintain this class. The similarity between this work and the regular school work with which the community is familiar facilitates judgment as regards provision for maintenance.

As in other cases, such items as length of term, hours per week, number of pupils, and cost of teaching must be taken into account, and the State board must assure itself that the funds provided will carry out in satisfactory manner the instruction contemplated.

CHARACTER AND CONTENT OF COURSES.

The Federal Board has taken a broad view concerning the meaning which can legitimately be given to the phrase "civic and vocational intelligence." Attention is here again called to the distinction between part-time trade extension and general continuation instruction. In the general part-time school or class there may be given subjects to enlarge the civic or vocational intelligence, and these subjects are held to mean the subjects usually given in public schools as a part of the elementary or high-school instruction. Thus it is possible to reach large numbers of boys and girls who have left school at the earliest age permitted by State compulsory-education laws, and who find themselves in need of guidance, either as to how

they shall get promotion, or make advantageous use of their time, or choose a more advantageous occupation. It is for these young persons that the law provides subjects which will enlarge their civic or vocational intelligence. The Federal Board stands ready to give the greatest latitude to the interpretation of this term, and will consider for approval any plan which will bring back to the school any group of workers over the age of 14, or which will take the school to the place where such workers are employed.

In general, courses of study will include such subjects as reading, writing, spelling, history, and arithmetic; such high-school subjects as elementary chemistry, physics, biology, mathematics, and economics; special subjects such as mechanical drawing, industrial history, commercial geography; and other studies such as civics and industrial evolution. In this connection the following quotation from the Massachusetts plan is of interest:

The general continuation part-time school presents a problem, in so far as the organization of the course of study is concerned, in that it has to deal with such a variety of pupils, both from the standpoint of general education secured before leaving school, the age upon leaving, and their desire to choose their final occupation. The pupils may be roughly divided into those who want more general education and those who want to choose a trade. In some general continuation part-time schools the courses provide that 50 per cent of the pupil's time be occupied with regular school subjects and the training be based upon the pupil's stage of advancement in the public schools upon the time of leaving; that 25 per cent of the time be devoted to the development of dominant interests and powers; and that 25 per cent of time be devoted to civics, hygiene, recreation, and cultural subjects. There may also be prevocational courses for pupils who have spent a preliminary period in the general improvement courses, and who, after advisements with parents, employers, and teachers, desire information whereby they may make an intelligent choice of a trade. The information is secured by (a) participation in shop work, (b) visits to established shops, (c) information from books, and (d) consultation with teachers and employers.

While the subjects of study may have the same names in the elementary or high school, nevertheless they should be taught with a different aim and a more careful selection of topics should be made. Care should be taken at every point to relate subjects of study with the daily life of the pupils.

METHODS OF INSTRUCTION.

a. *Grouping of students.*—Two requirements for entrance into the type of part-time class now under consideration may be indicated; the first a general requirement laid down by the Federal act, and the second a State requirement found only in those States having compulsory education laws. These are—

1. That the child shall be over 14 years of age.

2. That he shall be able to read and write the English language well enough to secure an age and schooling certificate in accordance with the laws of the State in which the school is located.

Pupils enrolled for general continuation part-time instruction should be organized in groups, whenever possible, according to (a) natural capacity; (b) present educational attainment; and (c) the vocational aims of individual pupils. Because of the diversity of ability, of aims, and of schooling received, classification if carried too far tends to create as many classes as there are pupils. The schooling experience will range through every grade of elementary and advanced work; and the experience of these same children will represent every degree of self-acquired information, from that of the unexperienced and incapable child to that of the sophisticated minor who, through necessity, has learned to do many things. It is, nevertheless, necessary to arrive at some grouping of students on the basis of the factors indicated, in order that classes may be as homogeneous as possible.

b. *General improvement classes.*—Pupils in a general continuation school may at the outset be grouped in general improvement classes intended to increase civic intelligence. Few of these pupils will bring to the school any definite vocational aims or any considerable knowledge of the occupation in which they are employed, and consequently a second purpose of this general class must be to determine the capacity of the pupil and the possibilities of his calling, and to instill into him some definite aim and ambition. For these purposes the pupils engaged in the same or similar occupations should be kept in one group. The instruction must be based upon adolescent psychology, and not upon the psychology used as a guide to instruction in the lower grammar grades.

c. *Size of classes.*—In trade extension part-time schools classes of 15, and in general continuation part-time schools, classes of 20, organized in fairly homogeneous groups, are as large as can be taught to advantage. On this basis a teacher should not be held responsible for more than 100 different pupils in general continuation part-time classes or for more than 75 pupils in trade-extension part-time classes. Provided the work is on a four-hour-a-week basis, this gives each teacher 20 hours per week of class instruction with an opportunity for "follow-up" work. A week's schedule may be brought up to 30 or 35 hours for each teacher as a maximum requirement for five days of six or seven hours. (Adapted from Massachusetts plan.)

d. *Special methods.*—Effective teaching of the adolescent involves an appeal to interest and initiative, the use of apperceptive power; a knowledge of the individualism of youth, and an appreciation of the "gang spirit." All the daily experiences of the home, the street, the

farm, or the workshop must furnish the opportunity and the occasion for the teacher to direct the activities of the child.

e. *Courses and programs.*—Regardless of the relationship already mentioned between general continuation schools and regular day schools, it can not be too forcibly emphasized that in organizing courses of study for the former, it is necessary to depart largely in content and considerably in method from the content and methods of full-time elementary courses of instruction.

A plan based upon general principles and carrying in it points of undoubted importance in the content of its course of study may be made for use in these classes. Definite programs of work, specific courses of study, and actual daily lessons can not, however, be safely prescribed. Each teacher must work out his own program, modify it to meet the industrial needs of his class, reshape it in the light of growing experience, and adapt it to the individual needs of his pupils.

In Appendix B will be found a valuable discussion of the problems here briefly stated. These are excerpts from the section on continuation schools in Massachusetts, Bulletin of the Board of Education, 1915, No. 6, whole No. 43. The division of time and program there given for the different types of schools sets up four hours of work per pupil per week, but with the understanding that the actual amount of time given to a subject within the general time allotment for each phase must be considered as elastic and as subject to change. Unless otherwise stated, the suggested programs are based on minimum standards.

HOURS PER YEAR.

There is no variation in rule between the length of term for general continuation classes and all other part-time classes. The minimum term is 144 hours per year, beginning July 1, and the maximum is one-half the working day prorated as explained heretofore under trade-preparatory work. The same flexibility of time distribution between days, weeks, and months of the year as given before applies to these classes. When regular school subjects are given, these classes might well be continued during the same period as that set for regular daywork in the schools.

QUALIFICATIONS OF TEACHERS.

In the part-time general continuation work, knowledge of pedagogical principles, ability to teach, and tact in handling pupils and in maintaining discipline is more important than high-grade trade and technical knowledge. Teachers of successful experience in grade and high-school classes are, therefore, desirable for this work.

On the other hand since the part-time pupils are employed, are often interested in industry, and are in many cases looking for labor advancement, no teacher will be successful with them who is not

interested in all these matters himself, who has not visited and does not continue to visit places of employment, and who does not seek at all times to view his teaching in the light of its intimate relationship to occupations. Most of the teachers employed will be in one of the two following classes:

(a) The shop teacher in a general continuation school where shop subjects are given to enlarge civic or vocational intelligence.

(b) The teacher of other subjects given to enlarge civic and vocational intelligence.

The shop teacher in the general continuation school is responsible for the teaching of such practical arts subjects as may be introduced either for the purpose of giving the pupils skill in handling concrete materials, or for the purpose of giving them a little experience in various shops in order that they may have some basis of choice as to what skilled trade they shall finally enter. The teacher who has this work should possess the qualifications usually acquired by persons graduating from normal schools, which especially prepare manual training or industrial-school teachers. These teachers, however, should have supplemented their education in all cases by practical experience.

None of these teachers should be permanently certificated until a period of trial has proved their efficiency in this work; furthermore, it would be better not to have part-time schools in the hands of any teachers except those who are thoroughly imbued with the missionary spirit and who realize the great importance of the task placed in their hands.

NOTE.—The recent ruling of the Federal Board makes it possible to organize part-time classes giving extensive instruction in other occupations than those in trades and industries. When such classes are organized the general principles outlined for part-time trade extension classes should be followed; as, for example, the qualifications of teachers, courses of study, etc.

Part IV. EVENING INDUSTRIAL SCHOOLS OR CLASSES.

DEFINITION OF EVENING SCHOOL OR CLASS.

An evening industrial school or class is one established and maintained under public control for the purpose of giving instruction supplemental to the day employment to persons who have entered upon a particular trade or industrial pursuit. Such a class is usually given in the evening, but may be given in the daytime for persons who are employed in the evening, the class at all times being given outside the regular hours of employment. Thus, in a three-shift plant a class coming from 4 to 6 p. m. would be a part-time class for workers on the shift from 12 noon to 8 p. m., and an evening class for those working on the shifts from 8 a. m. to 4 p. m. Evening industrial schools and classes must be set up, like other forms of industrial education, according to a plan adopted by the State board and approved by the Federal Board. (See Appendix A.)

WHAT A STATE PLAN SHOULD INCLUDE.

Any industrial evening school plan should cover specifically all those points which have been discussed with reference to other types of instruction, namely: Controlling purpose, age of admission, necessary plant and equipment, minimum for maintenance, character and content of courses of study, methods of instruction, and qualifications of teachers.

CONTROLLING PURPOSE.

To comply with the Federal act, the purpose of an evening school or class must be to provide normal, healthy individuals with vocational training for the common wage-earning industrial employments in which the pupils must then be engaged. It should not be for sub-normal pupils or be specially designed for backward or deficient pupils.

In the controlling purpose of an evening industrial school there must be consideration of (1) the kind of pupil that comes from industry; (2) the needs of the trade worker; and (3) the limited time the school can hold the pupil. These points are discussed more fully in Bulletin No. 18 on Evening Industrial Schools. They are mentioned here, however, as being necessary considerations in determining the controlling purpose of the evening school.

AGE OF ADMISSION.

The law provides that no person under 16 years of age shall attend upon evening instruction in Federal-aided classes, thus opening these classes to persons who are 16 years old or over. This is done because few persons under 16 years of age have entered upon a life employment which is worthy of supplemental instruction; because those between 14 and 16 seldom being in physical condition to add evening instruction to their regular day of labor; and because evening schools for younger pupils would offer an invitation to such pupils to leave the regular public schools before they had completed the elementary grades.

No maximum age limit is prescribed. Anyone over 16 years of age who can profit by supplemental instruction in his trade or industry may be admitted to an evening school. Experience has shown that the average age of pupils entering evening industrial schools will be considerably higher than the minimum.

NECESSARY PLANT AND EQUIPMENT.

The Federal Board will hold the State board responsible in every case for seeing that the plant and equipment is thoroughly adequate for carrying out the aims and purposes of the school.

It will not be advisable, and perhaps not possible at this time, to establish in the States absolute or quantitative standards for minimum plant and equipment. Section 17 of the act, however, sets up financial limitations regarding plant and equipment that must be observed. This section declares that no portion of any moneys appropriated under the act for the benefit of States shall be applied directly or indirectly to the purchase, erection, preservation, or repair of any building or buildings, or equipment, or for the purchase or rental of lands, or for the support of any religious or privately owned or conducted school or college. The entire cost incident to utilizing the laboratories and other plant and equipment of the institutions referred to is therefore to be provided out of other than Federal funds. There will be no objection, however, to the use by State boards of any laboratories suitably equipped, even those of private institutions. (See Bul. No. 1, p. 19.)

The following suggestions, as guides for the States and local communities, are offered under separate headings:

The building.—In the conduct of evening industrial schools practically all the communities have used only buildings which are designed primarily for day-school work. In the establishment of an evening vocational class in a city much consideration should be given to the question of where the class is to assemble. Probably if the city maintains a fully equipped day industrial or part-time school evening classes will be conducted in these schools.

It is not desirable, however, to restrict the establishment of evening classes to such school buildings without a careful consideration of the needs of the community.

The following are suggested as places where evening industrial schools may be housed: (1) In the building which houses a day or part-time trade or industrial school or department; (2) in a technical high-school building or the shops occupied by the practical arts department of a high school; (3) when related work only is to be given, in a regular classroom, where seating conditions are satisfactory for adults; (4) in private plants, where through an agreement equipment is available; (5) in rooms available in public libraries, in association of commerce buildings, in buildings occupied by labor associations; (6) in rented quarters near the homes of the pupils enrolled.

The selection of a location for evening classes must be carefully made, with due regard for the contiguity of the homes of pupils, the places of employment, and the means of transportation, such as car lines, bus lines, and railroads.

In the selection care should be taken that the rooms to be occupied are entirely suitable for the work which is to be done. The housing of the class will depend, as mentioned above, in large measure upon the character of the instruction to be given. In this connection it may be noted that of the two kinds of evening trade-extension work—(1) shop subjects and (2) related subjects—shop subjects must be given in a room fully equipped to carry on the actual processes of the trades which are to be taught as operations. In the case of related subjects, including such work as the mathematics of the trade, the science of the trade, the drawing of the trade, the safety and hygiene of the trade, the amount of equipment necessary is small; it can be transported from place to place; and it is inexpensive. A further description of the equipment will be found below.

Communities are further urged in planning and providing future buildings for industrial-school use to keep in mind their availability for evening-school work, since the Federal Board believes that evening industrial-school work is a form of vocational education which especially needs to be promoted and that it is through evening and part-time instruction that the most effective work can be done in carrying out the provisions of the Federal act.

Policy of the Federal Board as regards equipment.—Probably the policies of the Federal Board, as stated in Bulletin No. 1, can not be enlarged upon until after the country has gained more experience and until after studies have been made concerning the equipment necessary and adequate for the carrying on of each of the special trades which may be organized into evening instruction supplementary to the daily employment. Evidently standardiza-

tion must follow experimentation. In the case of evening-school classes there can be no general statements as to what constitutes an adequate equipment. An adequate shop equipment to give instruction supplemental to the sheet-metal trades would be much less than an adequate shop equipment to give instruction supplementary to machine-shop trades.

It is clear also that it will be impracticable for the Federal Board at the present time to set up a minimum sum which must be expended for equipment.

The State board of education should, however, provide in its plan that it reserves the right to approve the location of each evening industrial class established and the amount of equipment available before giving assurance to the community establishing the class that it may receive reimbursement from Federal funds, and in each instance there should be separate approval of the equipment for each trade or occupation taught. The State board must be certain in each case that the equipment is sufficient in quantity and variety to insure instruction in all the standard methods of the occupation for which the school proposes to give instruction.

There are two kinds of equipment which should receive consideration—the special industrial equipment and the general equipment.

Special industrial equipment.—The special industrial equipment, with its installation and outline of operation, should be approved by the State board. In most instances this equipment will have been designed for day school or other purposes, and the approval of the board will rest simply upon its adaptability to evening-school instruction. The approval of the State board should not fail also to extend to the method in which the equipment is installed, making certain that all State laws and the rules of the safety commission or similar body in the State are observed in order that all precautions against accident may be complied with.

Machines should be arranged in the shop also according to a recognized plan of production similar to that used in the best commercial shops. Tools and parts should be kept in systematically arranged tool rooms or cabinets and checked out to the pupils, as the same tools are handled in well-organized plants. In short, the entire industrial equipment should be laid out and used as nearly as possible like the layout and use of similar equipment in the industries to which the evening-school work is supplemental.

Further, the State board should provide in its plan for the use of advisory committees in the approval of special equipment to be used. As a matter of fact, a community before installing a special equipment to teach the work supplementary to a particular vocation in an evening school should endeavor to ascertain the views both of the employers and the employees in the community which the school

is to serve, concerning what is an adequate equipment for the particular trade, what particular machines should be used, their method of installation, the number of machines, and other conditions.

The school should not make the mistake of copying, without careful study of local conditions, the organization of a vocational school in a distant part of the country. By the use of an advisory committee the local school board and the State board of education can be fairly well assured that only standard equipment found in modern commercial establishments will be installed. It should be mentioned, however, that the school board should call to the assistance of the advisory committee some one who has had experience in teaching the trade which it is proposed to organize into the curriculum of the school. The school board would not then take the advice of the advisory committee without checking it up with the experience of this teacher and with the experience gained by other schools in establishing evening-school classes giving work supplementary to the daily employment. Men who are engaged in the work of the particular trade or who are engaged in employing workers in a particular trade are apt to consider production as the aim of paramount importance for the school equipped with commercial machines rather than the education of pupils.

General equipment.—General equipment includes books, apparatus necessary for teachers of related science and drawing, charts, blackboards, and desks. The usual standards observed in the State for general equipment in schools will be satisfactory as far as this part of the equipment of vocational schools is concerned.

In the consideration of plant and equipment for evening industrial schools, the Federal Board wishes to call particular attention to the difference in the aims between an all-day industrial school and an evening industrial school. An all-day industrial school is organized to give vocational education in a particular trade or industry to persons over 14 years of age who are preparing to enter upon a given trade or industrial pursuit. Instruction in an all-day school extends over six hours a day, and over at least 36 weeks a year.

An evening school is organized to give instruction to persons who have already entered upon employment, in classes in which the instruction is supplementary to the daily work. The plant and equipment in the former cases may be modified to meet the needs of beginners; the plant and equipment in the latter case must be designed to stand constant comparison with those of commercial production as measured by pupils who are fully acquainted with commercial work and quick to detect any pretense or imitation on the part of school authorities.

Equipment for specific unit processes.—The plant equipment must also be designed for instruction in specific unit processes, and for rapid instruction immediately to the point and immediately applicable to use in the day employment of the students. Equipment for highly scientific, philosophic, or long drawn-out fundamental principles has little or no place in evening schools.

The evening-school plant equipment, including library, seats, desks, and machinery, must be designed for mature pupils. As a matter of experience pupils in attendance in evening industrial schools are of greater maturity than is indicated by the minimum-age provision—16 years—as given in the law, while, on the other hand, pupils in the all-day industrial schools so far organized usually begin their work at about the minimum age of 14.

MINIMUM FOR MAINTENANCE.

The only statement of policy made by the Federal Board concerning the minimum amount to be expended for maintenance admits of the same variations as to the amount to be expended as is conceded in the case of plant and equipment in various communities.

The State board must hold itself responsible for the assurance that under maintenance there shall be appropriated ample funds for the upkeep and repairs to plant and equipment, and for such additional equipment as is needed from time to time to keep the instruction in line with the advances in commercial production.

A salary schedule must also be assured that will attract high-grade experienced men from the occupations which are to be taught in the evening classes. It may be well to fix a minimum rate of pay for these teachers, pointing out the desirability of exceeding the minimum wherever possible; but under no conditions should a maximum be fixed for salaries.

A maintenance budget must also take into consideration the varying number of nights of instruction for which a school or class is organized. If the work is organized on a short-course basis it may be entirely possible to have the evening school work supplementary to the day employment given in a very few evenings, say five or ten. On the other hand, the short course of instruction may extend over 200 nights or more during the year. It is evident, therefore, that the minimum amount to be expended for maintenance in the case of evening schools can not be fixed in terms of total expenditures for the year, but rather must be stated in units of instruction, as wage per hour, cost per pupil per hour, and cost per pupil or group of pupils per course.

Thus an evening class supplementary to a building trade might report as follows:

To instructor, 20 nights, at \$4-----	\$80. 00
To supplies, 15 men, 20 nights, at 8 cents per man per night-----	24. 00
To upkeep of equipment-----	15. 00
To new equipment-----	90. 00

The minimum for maintenance should take into account the materials and supplies necessary for successful work in an evening school class. This varies from trade to trade and varies according to whether the work is in related subjects or is to be conducted with complete commercial equipment. However, the work can not in the evening schools to the same extent as in all-day schools be given on a useful or productive basis. Much more of the work in the evening classes will be organized on the exercise basis, providing opportunity in the school to study operations which the pupils are called upon to perform during their day employment.

CHARACTER AND CONTENT OF COURSES.

It is not necessary to subject the courses of study in an evening school to such careful rules and regulations as those laid down for an all-day school, because a class dealing with shop work must perform work of a style nearly identical with the work in the pupil's day employment, and a class in related work must have a course which is dictated by the actual needs of the pupils for that work as shown by their daily occupation. There is, therefore, less chance in evening than in all-day schools for failure to reach the specific vocational needs of pupils and of failure to comply with the spirit of the Federal act.

The course of study, however, must be worked out with care to supply the most valuable information possible in the time allotted, and since this time is comparatively short the making of an evening course of study is a difficult and important task, more exacting even than planning out instruction for schools giving longer and more comprehensive courses. The importance of the personal factor as represented by the teacher in working out his own course of study for evening classes can not be overemphasized, especially where the classes are in related work. Before work in related subjects can be reimbursed from Federal funds the State board must be satisfied that the teacher has had satisfactory contact with the vocation to which the related work is supplementary. (Bulletin No. 1, p. 43.)

However, the State board must hold itself responsible for the review and approval of these courses of study in exactly the same

way as it assumes that responsibility for all-day industrial schools and should submit them to the Federal Board when requested or when in doubt regarding their value. As regards submission of courses, the following statement of policy by the board is in point:

Congress, by providing in section 8 that the plans submitted by the State board must be passed by the Federal Board, clearly vested in the latter authority to refuse to approve such plans as did not, in its judgment, contain courses of study necessary to accomplish the purposes of the act. It is the duty of the board, therefore, to determine, upon the submission to it of plans, the questions whether provision for supplementary instruction should be included therein. Thus, in proper cases the board reserves the right both to require and standardize such courses. (Bulletin No. 1, p. 32.)

While the above quotation relates more particularly to all-day schools, its provisions hold equally well for evening school courses.

The course of study in evening schools depends to such an extent upon the aim of the particular class which is to be taught, that no uniform course of study can be formulated for any large number of schools. Since the instruction is to be supplementary to the daily employment, and since the work is to be confined to the instruction of persons who have already entered a particular employment, and since it is impossible to give trade preparatory work in evening schools, it is evident that the course of study for a particular evening school class must be determined by an analysis of the trade and by the selection as a result of this analysis of the part of the trade which is to be taught.

The Federal Board believes that instruction in evening industrial schools can best be given in short but intensive courses for specific groups having a common basis of experience. As has been noted, analyses of various occupations can be found in various vocational surveys, notably in the surveys for Richmond, for Minneapolis, and in those for the State of Indiana. The United States Department of Labor has published bulletins giving analyses of occupations, and the Federal Board in its War Emergency Training Series (Bulletins Nos. 2, 3, 4, 7, 8, 10, 11, and 12), furnishes information valuable for school authorities who are formulating evening courses for particular groups.

Sample courses which illustrate the method in which a course may be prepared for submission to the State board for approval are appended to a special bulletin on Evening Industrial Schools (Bulletin No. 18, Trade and Industrial Series No. 2).

State boards should provide in their plans for evening school work the greatest latitude to the local communities, leaving always with the local community the burden of proof that the work which it is proposed to give in the trade class shall be definitely organized to provide instruction which is actually supplemental to day employment. Course outlines need not be long nor extensive, but should

indicate clearly the topics to be covered. Courses of study should be subject to individual approval by the State board.

Since no fixed course of study, imposed upon a State or local community regardless of its particular needs, would insure successful classes, the State plan should lay down only general principles in accordance with which evening school courses are to be prepared. The limitations as to the time available for such work and the consequent necessity for careful planning and elimination of all unessential details should be pointed out. The State board should provide, also, suggestive information for local communities in the way of sample courses of study already approved.

A local community in preparing a course of study should secure assistance from every source possible. It can well make use of an advisory committee consisting of representatives of employers, employees, and school authorities, for discussion of the proposed work.

It can not be too strongly emphasized that the place to get material for these courses is in the commercial shops where the pupils are employed, and that the people to pass upon their content are those actually familiar with the trade or industry in question—whereas the good offices of the schoolman are needed in formulating this material into a “well-rounded course of study” in which the trade knowledge is organized for instruction purposes. This is further discussed in the following section.

WORK SUPPLEMENTARY TO DAY EMPLOYMENT.

“Evening instruction can be given only in such subjects as will increase skill or knowledge in the occupation in which the worker is engaged as his daily employment, or as will lead to promotion or advancement in that work. The time available in an evening school is so short that it is impossible to teach a skilled trade to anyone unless he is engaged in daily work affording him opportunity to apply the skill or knowledge gained in the evening school, or unless the daily employment gives an experience which will enable the worker, with the knowledge or skill acquired in an evening school, to secure promotion in that occupation. The work can be most effectively given when workers in similar or allied occupations are grouped together.”

The interpretation of this ruling regarding evening school work has given rise to much discussion in various sections of the country. A fuller treatment of the whole subject is given in the bulletin on Evening Industrial Schools, but the limitation imposed by the Federal act is so important that a brief statement regarding it seems required here also.

There is a feeling that evening school courses publicly supported should be open to everyone who applies to take the course. The very great movement for the organization of evening courses which

has taken place in the last few decades in the United States has been along the line of general educational improvement, rather than in the line of specific improvement of workers in a trade in which they are already engaged.

It is evident that the limited time available makes it impossible for an evening school to provide a course which will give preparatory work. The minimum time which can be devoted to shop work in an all-day school is 3 hours per day, or 15 hours per week. In a trade preparatory day course, therefore, running 40 weeks a student would receive 600 hours in shop work. To give even this minimum trade preparatory course in an evening class meeting four hours per week—the usual time given—would require 150 weeks, or nearly three years. Since a trade preparatory day course extends over never less than one year, and extends frequently over two or three years, a corresponding evening course would need to be of from three to nine years' duration to give an equivalent trade preparation to those not actually employed at the trade. The Federal act clearly provides that work of a general nature or trade preparatory work can not be given in evening classes. The Federal Board has, therefore, absolutely no choice in the matter. As far as evening schools are concerned, it can approve only plans which provide for reimbursement of teachers engaged in giving supplemental work and such work only.

The Federal Board has only words of commendation for any evening school organization designed to give general education, commercial vocational education, practical arts instruction, instruction in English to foreigners, civic improvement instruction, recreational courses, choral work, amateur dramatics, athletics, gymnastics, public lecture courses, or any other sort of evening work intended for general education or for physical or moral betterment. It points out, however, that among the many kinds of work for which evening schools may be organized there is only one for which money apportioned under the Federal act can be used, namely, instruction to workers from the trades and industries, when such instruction is supplemental to the daily employment.

GROUPS OF WORKERS WHO MAY BE REACHED BY EVENING CLASSES.

Evidently, then, the first step to be taken by a community which is to organize an evening-school class which is to receive the benefits of the Federal act is to determine whether there is a sufficiently large group of workers engaged in any industrial occupation and desirous of receiving instruction to warrant the organization of a class.

The instruction, if undertaken, may be expected to confer upon the pupils taking it one or more of the following benefits: First,

the acquisition of knowledge or skill which will lead to promotion in the particular occupation. Second, the acquisition of knowledge or skill which will lead to the taking up of advanced work in the particular trade. Third, the acquisition of knowledge or skill which will lead to increased remuneration for work in that trade.

The specific groups of workers which may be reached by an evening industrial school are indicated in the bulletin on Evening Industrial Schools.

Instruction given to any group of workers must be supplemental to their daily employment, and its controlling purpose must be to further fit them for the employment in which they are engaged and for promotion in the employment.

METHODS OF INSTRUCTION.

Methods of instruction will depend largely upon the purposes of the particular evening school or class, and it is evident that the methods must differ largely from those successfully followed in all-day industrial schools. They must make certain that the work of the class is shaped in accordance with actual experience and the daily employment of the group taking the work. They must be direct and to the point. They must include the "tricks of the trade." The instruction must be presented in such a way that the pupils will be convinced that each evening's work gives them specific knowledge of benefit to them in their daily work. (For a more detailed account of methods of instruction, see Bulletin 18 (Trade & Indus. Ser. No. 2), Evening Industrial Schools.)

QUALIFICATION OF TEACHERS.

Adequate vocational experience or contact is an essential qualification for teachers; and, as bearing upon this requirement, the quotations from the board's Statement of Policies, introduced in the section on "Certification" for all-day unit trade school-teachers, are in point as indicating qualifications requisite also for evening-school teachers.

In the approval of State plans during the past year the Federal Board has refused to approve for any State a plan which did not provide for an adequate practical experience on the part of teachers to be employed in evening industrial schools or classes. There is practical unanimity in the plans in requiring at least three years' experience beyond the apprenticeship stage for prospective teachers of shop subjects in unit trade schools. The State plans approved require also that the related-subjects teacher shall have had adequate technical-school training, usually supplemented by satisfactory contact with the industry for which related work is given.

For 1917-18 few, if any, States differentiated requirements for teachers of shop subjects and related subjects in all-day schools from

those of teachers engaged in similar evening-school work. With growing experience, in consequence of the establishment of all-day industrial schools and of evening-school classes in larger numbers as is expected, there will be necessarily a differentiation in the qualifications of shop teachers of day and evening schools. Probably the teacher who is eligible for employment in the shop work of a unit trade school, or for employment as a teacher of related-subjects work in a day trade school, will be eligible to give similar instruction in an evening school. The shop teacher, however, in a general industrial school for cities of less than 25,000 population may often be ill suited to the shop teaching in evening classes, if not actually unqualified.

On the other hand, it may be necessary to secure additional instructors for evening schools, who do not possess all of the qualifications above demanded in the case of day-school teachers. This will be especially true after plans for training teachers have been in operation for any considerable length of time. It is certain, however, in the case of evening schools, that the standard concerning practical experience and evidence of successful work must always be kept in mind. Since the work in evening schools is to be of such a practical nature and supplemental to the day employment, and since groups of men and women will be organized to receive a special training in particular occupations, processes, or essential knowledge in the trade, it will be necessary to exercise great care in selecting the teachers who possess a very thorough knowledge of the particular things which are to be taught in the particular class. Responsibility in making the selection of the right teacher for an evening-school class should be largely that of the local community. The State plans, however, should so clearly indicate the different possibilities that a local community will have a basis for judgment as to proper qualifications. The plans should provide also that before a teacher enters upon evening-school employment the approval of the State board shall be secured and full statements concerning the qualifications of the prospective teacher should be submitted with the application for approval.

The Federal Board believes, as is evidenced by the plans which have been approved for the past year, that an adequate vocational experience in the particular trade can rarely be secured in the school itself. In other words, the Federal Board does not believe that as a rule a graduate of any school, trade or technical, is prepared to become a shop teacher in an evening-school class, giving instruction supplemental to the day employment, without having had adequate experience either before or after graduation in the work of the particular trade under commercial conditions.

The Federal Board is anxious to have shop teachers of evening-school work secured with as much general education as possible, and it hopes the time will come when graduates of higher technical schools, after having had adequate trade experience, may be induced to give evening-school instruction. It believes, however, that the number of such teachers available will be inadequate to the demands for some time to come, and that for the present at least most of the teachers of shop subjects in evening industrial schools must be taken from the ranks of workers who have not had a secondary or higher education, but have had high-grade commercial-shop experience and some preparation for teaching that work. It is fundamental to the success of any shop class that the instructor who has charge of the work conducted for the benefit of persons who have entered upon employment should himself have had an opportunity of mastering the trade in which he is giving instruction.

In order that teachers with necessary trade experience may be secured to give evening-school instruction, and in order that the greatest latitude may be given to local communities in recruiting desirable teachers, many of the States have had to modify the usual certifying rules. There does not exist an adequate supply of teachers of the requisite trade experience, who have had in addition to this experience a general education extending far enough beyond the elementary school stage to enable these teachers to qualify for positions in the public schools under the rules of certification usually maintained in the States. It is granted that the more general the education of any teacher the more competent he is as a teacher, provided that in addition to his general education he has had experience under actual shop conditions in the trade he proposes to teach.

It may be concluded, therefore, that prospective teachers, especially of shop work, for evening schools must be recruited largely from those who have had little general education. It must be remembered that the chief duty of an instructor in an evening-school class is to impart to others skill and knowledge of the processes of the trade, hence trade experience and success must always be the principal criterion used in the selection of a teacher.

RELATED SUBJECT TEACHERS.

Usually State plans have not set up standards of qualifications for teachers of related-subjects work in evening schools different from those set up for similar teachers in day industrial schools. As a matter of fact, the related-subjects teacher in the evening school should have had much more practical experience than we can at the present time demand for the related-subjects teacher who is giving instruction to immature boys and girls. The related-subjects teacher in the evening school is dealing with men and women of considerable practical experience in the trades. These men and women come to

evening classes in order that they may learn the science, the mathematics, or the drawing of their trade, knowledge of which will be an asset to them in securing a larger rate of pay in the work in which they are engaged or in securing promotion to another branch of the trade. It is evident, therefore, that the State plans should be revised so that in the case of qualifications of related-subjects teachers in evening industrial schools greater emphasis shall be placed upon practical experience.

Here, again, it is expected that the teacher-training plan in the State will be of material assistance in selecting from the trades men who are capable of giving the related-subjects work. The essential which must be observed in making the selection of related-subjects teachers for evening schools is the knowledge of the subject which is to be taught with its application to the trade to which the subject is related.

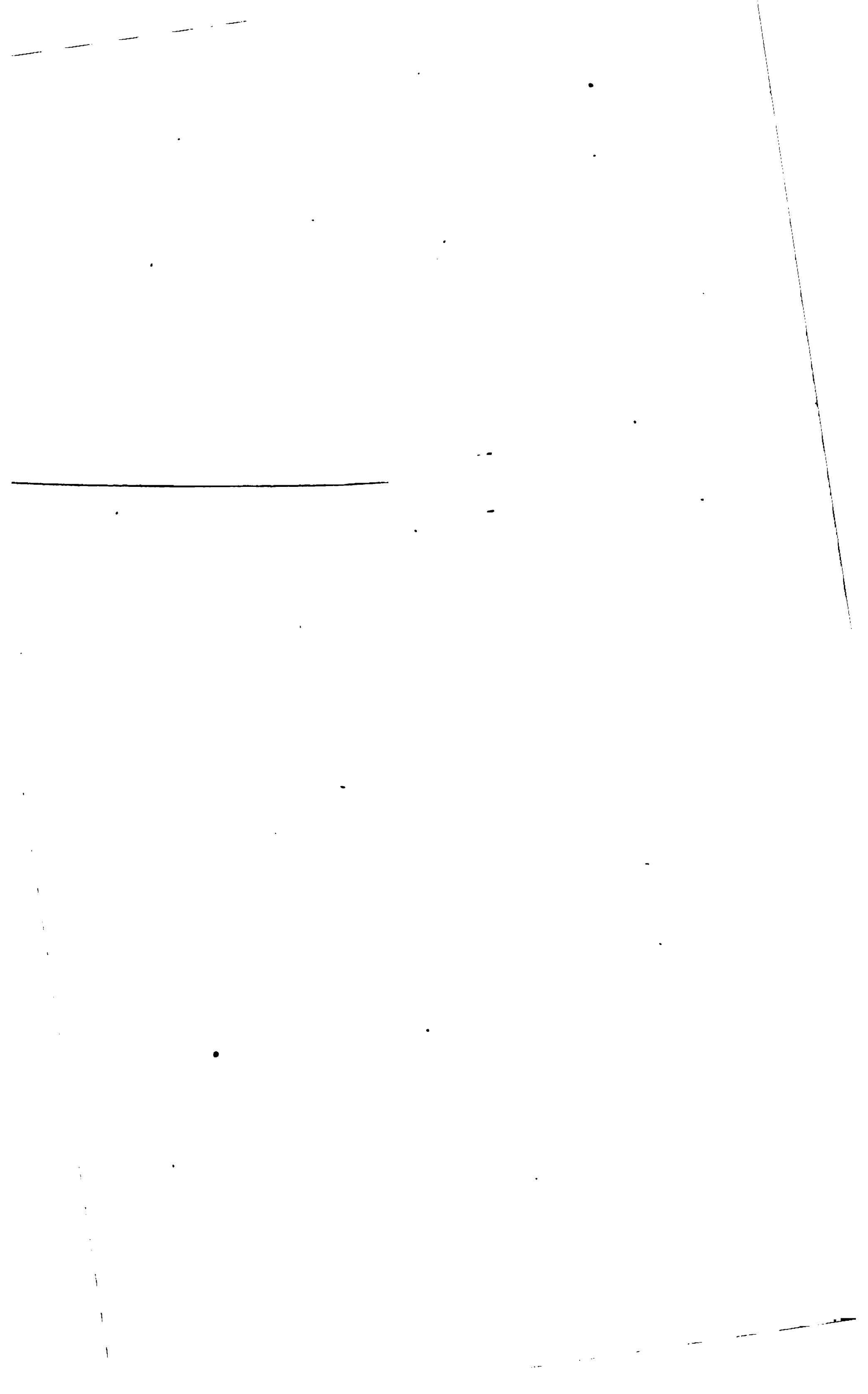
MINIMUM AGE FOR EVENING-SCHOOL TEACHERS.

Nothing is said in the statement of policies concerning age qualification. There is a considerable variety in the proposals made by the several States. The minimum age selected by any State was 21 years, but the Federal Board believes that there is rarely a case where a teacher 21 years of age can have had a successful experience in the vocation he proposes to teach. It may be said, however, that if the State board of education sets up the experience qualifications in its plan as above, the matter of age will very largely take care of itself, since it is hardly possible for the persons who have devoted several years to learning a trade, and have had at least three years of successful experience in the trade, to enter upon teaching much under the age of 25 years.

There are certain qualifications other than those mentioned above, which teachers should possess which can not be measured in terms of experience or in age. These qualifications are difficult to enumerate, harder to define, and still harder to measure. The State board should reserve the right to approve or disapprove a teacher on its judgment concerning some of these indefinite qualifications, among which may be mentioned character, attitude toward work, liking for young people, personality, honesty, and veracity.

Approval of a particular teacher's work in an evening school should be given from year to year. The Federal Board believes that it is inadvisable to issue certificates which shall make the holder eligible for employment only as a teacher of evening-school work. It is, however, possible to have the certificates held by the teachers of the day industrial school so framed that the possession of such a certificate will make its holder eligible for evening-school employment, provided the subject which it is proposed to teach is covered in the certificate.

APPENDICES



APPENDIX A.

OUTLINE FOR PLANS OF STATES FOR YEAR 1918-19.

I. Administration and supervision:

1. General direction (including names of executive officer and State director of vocational education).
2. Agricultural education.
3. Trade and industrial education.
4. Home economics education.
5. Teacher-training. (See sec. 10, Smith Hughes Act.)

II. General conditions:

1. Must be under public supervision or control.
2. Controlling purpose to fit for useful employment.
3. Less than college grade.
4. For persons over 14 years of age.
5. Every dollar of Federal funds must be matched by a dollar of State or local money, or both.
6. Money to be expended only for—
 - A. Salaries of teachers, supervisors, and directors of agriculture.
 - B. Salaries of teachers of trade, home economics, and industrial subjects.
 - C. Maintenance of teacher-training for vocational teachers. Maintenance not to include items (buildings, etc.) prohibited under section 17 of the act.

III. Agricultural education:

1. Kinds of schools. (14)¹
2. Plant and equipment. (15)
3. Minimum for maintenance. (16)
4. Courses of study. (17) (Include type courses of study for each type of school proposed. Course to include both vocational and nonvocational subjects and time in minutes per week to be given to each subject or group of subjects.)
5. Methods of instruction. (18)
6. Qualifications of teachers. (18)
7. Qualifications of supervisors or directors. (19)
8. Plans for at least six months' supervised practical work. (20)

IV. Trade, home economics and industrial education:

1. A tentative budget of the Federal funds available for trade and industrial education, including amounts to be used for:
 - A. Evening schools or classes.
 - B. Part-time schools or classes.
 - C. Unit-trade schools or classes.
 - D. General industrial schools or classes in cities or towns of less than 25,000.
 - E. Home economics.

¹ Figures refer to page number of Bulletin No. 13, Agriculture Series No. 1, published by the Federal Board.

IV. Trade, home economics and industrial education—Continued.

2. Trade and industrial education.

A. A statement of the kinds of trade and industrial education which the State board intends to aid from Federal funds during the fiscal year ending June 30, 1919.

a. Evening industrial schools.

b. Part-time schools or classes.

(1) Trade-extension part-time schools or classes.

(2) Trade-preparatory part-time schools or classes.

(3) General continuation part-time schools or classes.

c. Unit-trade day schools or classes.

d. General industrial day schools or classes in towns and cities of less than 25,000 population.

B. Evening industrial schools or classes.

a. Controlling purpose—stated in aims of the classes.

b. Minimum entrance age requirement.

c. Required or minimum plant and equipment.

d. Minimum for maintenance.

e. Character and content of the course of study. (Give type course or courses.)

f. Character of the school work (supplementary).

g. Methods of instruction.

h. Qualifications of teachers, stated in terms of—

(1) Shop teachers.

(2) Related subjects teachers.

C. Part-time schools or classes.

a. Trade-extension part-time schools or classes.

(1) Controlling purpose stated in aim of classes.

(2) Age of pupils.

(3) Required or minimum plant and equipment.

(4) Minimum for maintenance.

(5) Character and content of courses of study.

(Give type course or courses.)

(6) Methods of instruction.

(7) Length of term—hours a week.

(8) Qualifications of teachers.

(a) Shop teachers.

(b) Related-subjects teachers.

b. Trade-preparatory part-time schools or classes.

(1) Controlling purpose—stated in aim of the classes.

(2) Age of pupils.

(3) Required or minimum plant and equipment.

(4) Minimum for maintenance.

(5) Character and content of courses of study.

(Give type course or courses.)

(6) Methods of instruction.

(7) Length of term—hours a week.

(8) Qualifications of teachers.

(a) Shop teachers.

(b) Related-subjects teachers.

IV. Trade, home economics and industrial education—Continued.**2. Trade and industrial education—Continued.****C. Part-time schools or classes—Continued.****c. General continuation part-time schools or classes.**

- (1) Controlling purpose—stated in aims of classes.
- (2) Minimum and maximum age of pupils.
- (3) Required or minimum plant and equipment.
- (4) Minimum for maintenance.
- (5) Character and content of the course of study.
(Give type course or courses.)
- (6) Methods of instruction.
- (7) Length of term—hours a week.
- (8) Qualifications of teachers.

D. Day unit-trade school.

- a. Controlling purpose—stated in aims of classes.
- b. Age of admission.
- c. Required or minimum plant and equipment.
- d. Minimum for maintenance.
- e. Character and content of courses of study. (Give type course or courses.)
- f. Methods of instruction.
- g. Amount of time given to practical work on a useful or productive basis and a statement concerning the nature of the practical work.
- h. Length of school year.
- i. Hours of instruction per week.
- j. Qualifications of teachers.
 - (1) Shop or trade teachers.
 - (2) Related-subjects teachers.
 - (3) Nonvocational-subjects teachers.

E. General industrial schools for cities and towns of less than 25,000 population.

- a. Controlling purpose stated in aim of classes.
- b. Age of admission.
- c. Required minimum for plant and equipment.
- d. Minimum for maintenance.
- e. Character and content of courses of study. (Give type course or courses.)
- f. Methods of instruction.
- g. Amount of time given to practical work on a useful or productive basis.
- h. Length of school year.
- i. Hours of instruction per week.
- j. Qualifications of teachers.
 - (1) Shop or trade teachers.
 - (2) Related-subjects teachers.
 - (3) Nonvocational-subjects teachers.

3. Home-economics education.**A. A statement of the kinds of home-economics education which the State board intends to aid from Federal funds during the fiscal year ending June 30, 1919.**

- a. Evening home-economics schools or classes.

IV. Trade, home economics and industrial education—Continued.

3. Home-economics education—Continued.

A. A statement of the kinds, etc.—Continued.

- b. Part-time home-economics schools or classes.
- c. Day schools or classes in cities of over 25,000.
- d. Day schools or classes in cities or towns of less than 25,000.

B. Evening home-economics schools and classes.

- a. Minimum entrance-age requirement.
- b. Required or minimum plant and equipment.
- c. Minimum for maintenance.
- d. Character and content of the course of study. (Give type course or courses.)
- e. Character of the school work. (Supplementary.)
- f. Methods of instruction.
- g. Qualifications of teachers.
 - (1) Practical experience.
 - (2) Professional training.
 - (3) Training in home economics.

C. Part-time economics schools and classes.

- a. Age of pupils.
- b. Required or minimum plant and equipment.
- c. Minimum for maintenance.
- d. Character and content of courses of study. (Give type course or courses.)
- e. Methods of instruction.
- f. Length of term—hours a week.
- g. Qualifications of teachers.
 - (1) Practical experience.
 - (2) Professional training.
 - (3) Training in home economics.

D. Day schools in cities of more than 25,000.

- a. Age of admission.
- b. Required or minimum plant and equipment.
 - (1) For food study, cooking, and preparation of meals.
 - (2) For garment making and dressmaking.
 - (3) For home nursing.
 - (4) For laundry work.
- c. Minimum for maintenance.
- d. Character and content of courses of study. Plan should include type courses of study for work proposed in schools. This course of study should show clearly the amount of time to be devoted to home-economics subjects and to related subjects, to home practice or home project work, if any.
- e. Methods of instruction.
- f. Amount of time given to practical work on a useful or productive basis and a statement concerning the nature of the practical work.
- g. Length of school year.
- h. Hours of instruction per week.

IV. Trade, home economics and industrial education—Continued.

3. Home-economics education—Continued.

D. Day schools in cities of more than 25,000—Continued.

1. Qualifications of teachers.

- (1) Practical experience.
- (2) Professional training.
- (3) Training in home economics.

E. Day schools in cities and towns of less than 25,000.

- a. Age of admission.
- b. Required or minimum plant and equipment.
- c. Minimum for maintenance.
- d. Character and content of courses of study. (Typical courses proposed by State board.)
- e. Methods of instruction.
- f. Amount of time given to practical work on a useful or productive basis and a statement concerning the nature of the practical work.
- g. Length of school year.
- h. Hours of instruction per week.
- i. Qualifications of teachers.
 - (1) Practical experience.
 - (2) Professional training.
 - (3) Training in home economics.

V. Teacher training:

1. Proposed percentage use of funds as to training teachers of—

- A. Agricultural subjects.
- B. Trade and industrial subjects.
- C. Home-economics subjects.

2. Agriculture:

- A. Kinds of schools and classes. (23)¹ (Name and location of each institution or center.)
 - 1. If improvement of teachers in service or itinerant teacher training is contemplated, include detailed plan for such training.
- B. Length of course.
 - a. In years.
 - b. In unit hours.
- C. Entrance requirements. (24)
- D. Courses of study. (25) (Complete course of study from each institution named under A, including names of subjects and time to be given to each.)
- E. Provisions for observation and practice teaching. (25)
- F. Graduation requirements, including practical experience. (25)
- G. Relation to certification.
- H. In case any special teacher-training courses other than the above are to be offered give detailed plans for such training following the points given under A–G above.

B. Trades and industries.

- A. Kinds of schools and classes. (Name and location of each institution or center.)

¹ Figures refer to page numbers of Bulletin 13, Agricultural Series No. 1, published by the Federal Board.

V. Teacher training—Continued.**3. Trades and industries—Continued.****B. Work to be undertaken by each of these institutions covering the following:****a. Shop teachers.**

- (1) Entrance requirements.
- (2) Length of course.
 - (a) In years.
 - (b) In unit hours.
- (3) Course of study. (Complete course of study from each institution named under A, including names of subjects and time to be given to each.)
- (4) Provisions for observation and practice teaching.
- (5) Graduation requirements. (Including practical experience.)
- (6) Relation to certification.

b. Related subjects teachers.

- (1) Entrance requirements.
- (2) Length of course.
 - (a) In years.
 - (b) In unit hours.
- (3) Course of study. (Complete course of study from each institution named under A, including names of subjects and time to be given to each.)
- (4) Provisions for observation and practice teaching.
- (5) Graduation requirements. (Including practical experience.)
- (6) Relation to certification.

c. General continuation part-time school-teachers.

- (1) Entrance requirements.
- (2) Length of course.
 - (a) In years.
 - (b) In unit hours.
- (3) Course of study. (Complete course of study from each institution named under A, including names of subjects and time to be given to each.)
- (4) Provisions for observation and practice teaching.
- (5) Graduation requirements.
- (6) Relation to certification.

d. Training of teachers who have entered service.

- (1) Character of work to be undertaken.
- (2) Time to be devoted to the work.

C. In case the State has any variations in the training for shop teachers or related subjects teachers for unit trade, general, industrial, evening, part-time trade extension or part-time trade preparatory work, give a detailed plan for such training following the points given under a, b, and c.

V. Teacher training—Continued.**4. Home economics.**

- A. Kinds of schools and classes.** (Name and location of each institution or center.)
 - a.** If improvement of teachers in service or itinerant-teacher training is contemplated include detailed plan for such training.
- B. Entrance requirements.**
- C. Length of course.**
 - (a)** In years.
 - (b)** In unit hours.
- D. Courses of study.** (Complete course of study from each institution named under A, including names of subjects and time to be given to each.)
- E. Provisions for observation and practice teaching.**
- F. Graduation requirements** (including practical experience).
- G. Relation to certification.**
- H.** In case any special teacher-training courses other than the above are to be offered give detailed plans for such training following the points given under A-G above.

APPENDIX B.

THE MASSACHUSETTS PLAN FOR PART-TIME GENERAL CONTINUATION SCHOOLS.¹

One-half of the time should be devoted to specific training, based on acquirements gained in day schools, in the home, and in work, and in such subjects as the purpose of the pupil makes necessary. These subjects include—

English.—This course should include oral expression and written compositions on subjects based on real experiences and on actual situations in which the pupil is interested. Class exercises will include debating, argument, narration, reading aloud, and writing letters, reports, and compositions.

Spelling, writing, punctuation, use of dictionary, and pronunciation should be taught, as they find a natural place in such exercises. Expression should be encouraged but not forced, and pupils should not be severely criticized for crudities in speech or writing. Many of these pupils will find difficulty in making themselves understood. Minors are in many cases dependent upon the moods of inspiration, and do not respond well when required to produce compositions on set occasions.

The supplementary work above these requirements would be determined by individual needs. Thus, an eighth-grade pupil preparing for admission to an evening high school, with college and professional life as a deferred aim, would require more than this minimum. •

Arithmetic.—The exercises in this subject should be drawn from the pupil's experience and be based upon his evident needs. Accuracy and speed in fundamental processes, fractions used in business, simple measurements, percentage and its application would probably cover the processes required in any occupation or activity in which these pupils are engaged.

The supplementary work above this minimum would be determined by individual needs, as in the case of English.

Other subjects may be introduced, such as literature, geography, and drawing (for appreciation and expression). Topics in these subjects should not be presented in a routine schedule, but as opportunity presents and occasion arises.

Much pertinent information of general cultural value may also easily be given. If this is properly related to what pupils already know, it will become a part of his organized knowledge.

(b) Substantially one-fourth of the time should be devoted to discovering and cultivating the native interests and powers of the pupil. Knowledge and insight might be secured by oral and manual exercises, which give the pupil information regarding an occupation which otherwise could be gained only by years of experience. The work should be of as great variety in content and in character

¹ Quoted from bulletin of the Massachusetts Board of Education, 1915, No. 6, whole No. 43.

as there are pupils in the classes. Such manual work for boys and home making for girls as are done should be included in this time allotment.

It is work of the latter kind which, above all others, continuation-school pupils like to do and are usually best fitted to undertake. The courses may be either academic or practical in character.

(c) Substantially one-quarter of the time should be devoted to civics, hygiene, recreation, and cultural studies, such as literature, music, and history.

Instruction in civics should be based upon the needs, opportunities, and privileges of the pupils as future citizens. The material should be as concrete as possible, and should deal primarily with facts within the pupil's experience. Beginnings can be made whereby the pupil's understanding of the institutions which society has established for its government and protection can be developed.

Instruction in hygiene should be practical and should be made applicable to personal needs. Information regarding occupational disease, safety appliances, and first aid should be included.

Recreation courses should include training to conserve the strength and health of the pupil by means of games, gymnastics, and baths, as well as entertainments and amusements, to relieve the monotony of regular employment. The love of exercise, strong in this group of pupils, can be so directed as to arouse a real interest in the various functions of the body.

Cultural studies should include any subjects whereby the cultural aim is to be attained.

Academic division.—A distinct section in general improvement schools is that which may be called the "advanced academic division." The aim of the academic division is to serve those pupils who are ambitious to pursue studies of a more advanced nature, such as are offered in evening high-schools or required for admission to higher institutions of learning. Pupils may desire to enter professional or semiprofessional vocations, as nursing, civil engineering, dentistry, pharmacy, the ministry, or teaching. Such pupils vary widely as regards previous education. Probably no class will consist of a single homogeneous group. Each class will comprise several small homogeneous groups having similar aims, but each group possibly composed of individuals no two of whom have exactly the same educational background or ambition. Hence, this instruction must meet individual needs. There will be opportunities for class instruction in such subjects as civics and hygiene. Whether instructions in any particular subject are to be individual or class work must be settled with reference to conditions of groups and individuals.

The scope of the instruction in this division should be limited only by the educational acquirement and the capacity of the individual. It is the duty of the teacher to furnish pupils a variety of opportunities and to acquaint them with the facilities accorded by evening high-schools, public libraries, and well-directed reading.

A proposed outline of courses of study for general continuation schools is as follows:

1. Specific training; 50 per cent of the time allotment.
 - (a) English.
 - (b) Arithmetic.
 - (c) Geography and history.

This work, based upon the acquirement and experience of the pupil, is for the specific purpose of removing deficiencies and adding to his resources, and is a work peculiar to the general improvement type of continuation school.

2. Courses intended to lead to a discovery of interests and development of powers and to promote self-confidence, reliance upon judgment, and initiative; 25 per cent of the time allotment.

(a) Specializing in that type of school work in which most interest and power are manifested.

(b) Testing capacity in some manual work, as—

(1) Regular shop work for boys.

(2) Homemaking for girls.

(c) By giving knowledge and understanding of vocational possibilities and opportunities.

Such work is peculiar to the general improvement type of continuation school.

3. General training; 25 per cent of the time allotment.

(a) Civics.

(b) Hygiene.

(c) Recreative work.

(d) Cultural studies.

This work is common to all types of continuation schools.

Specialization should be allowed whenever any pupil's needs seem to be best served by such a program. Home environment, daily occupation, and special activities are sources of negative as well as positive information bearing upon the pupil's aptitudes.

APPENDIX C.

SECTION 1.

[PUBLIC, No. 347, SIXTY-FOURTH CONGRESS.]

[S. 703.]

AN ACT To provide for the promotion of vocational education ; to provide for cooperation with the States in the promotion of such education in agriculture and the trades and industries ; to provide for cooperation with the States in the preparation of teachers of vocational subjects ; and to appropriate money and regulate its expenditure.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there is hereby annually appropriated, out of any money in the Treasury not otherwise appropriated, the sums provided in sections two, three, and four of this act, to be paid to the respective States for the purpose of cooperating with the States in paying the salaries of teachers, supervisors, and directors of agricultural subjects, and teachers of trade, home economics, and industrial subjects, and in the preparation of teachers of agricultural, trade, industrial, and home economics subjects ; and the sum provided for in section seven for the use of the Federal Board for Vocational Education for the administration of this act and for the purpose of making studies, investigations, and reports to aid in the organization and conduct of vocational education, which sums shall be expended as hereinafter provided.

SEC. 2. That for the purpose of cooperating with the States in paying the salaries of teachers, supervisors, or directors of agricultural subjects there is hereby appropriated for the use of the States, subject to the provisions of this act, for the fiscal year ending June thirtieth, nineteen hundred and eighteen, the sum of \$500,000 ; for the fiscal year ending June thirtieth, nineteen hundred and nineteen, the sum of \$750,000 ; for the fiscal year ending June thirtieth, nineteen hundred and twenty, the sum of \$1,000,000 ; for the fiscal year ending June thirtieth, nineteen hundred and twenty-one, the sum of \$1,250,000 ; for the fiscal year ending June thirtieth, nineteen hundred and twenty-two, the sum of \$1,500,000 ; for the fiscal year ending June thirtieth, nineteen hundred and twenty-three, the sum of \$1,750,000 ; for the fiscal year ending June thirtieth, nineteen hundred and twenty-four, the sum of \$2,000,000 ; for the fiscal year ending June thirtieth, nineteen hundred and twenty-five, the sum of \$2,500,000 ; for the fiscal year ending June thirtieth, nineteen hundred and twenty-six, and annually thereafter, the sum of \$3,000,000. Said sums shall be allotted to the States in the proportion which their rural population bears to the total rural population in the United States, not including outlying possessions, according to the last preceding United States census : *Provided*, That the allotment of funds to any State shall be not less than a minimum of \$5,000 for any fiscal year prior to and including the fiscal year ending June thirtieth, nineteen hundred and twenty-three, nor less than \$10,000 for any fiscal year thereafter, and there is hereby appropriated the following sums, or so much thereof as may be necessary, which shall be used for the purpose of providing the minimum allotment to the States provided for in this section : For the fiscal year ending June thirtieth, nineteen hundred and eighteen, the sum of \$48,000 ; for the fiscal year ending

June thirtieth, nineteen hundred and nineteen, the sum of \$34,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty, the sum of \$24,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-one, the sum of \$18,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-two, the sum of \$14,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-three, the sum of \$11,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-four, the sum of \$9,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-five, the sum of \$34,000; and annually thereafter the sum of \$27,000.

SEC. 3. That for the purpose of cooperating with the States in paying the salaries of teachers of trade, home economics, and industrial subjects there is hereby appropriated for the use of the States, for the fiscal year ending June thirtieth, nineteen hundred and eighteen, the sum of \$500,000; for the fiscal year ending June thirtieth, nineteen hundred and nineteen, the sum of \$750,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty, the sum of \$1,000,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-one, the sum of \$1,250,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-two, the sum of \$1,500,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-three, the sum of \$1,750,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-four, the sum of \$2,000,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-five, the sum of \$2,500,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-six, the sum of \$3,000,000; and annually thereafter the sum of \$3,000,000. Said sums shall be allotted to the States in the proportion which their urban population bears to the total urban population in the United States, not including outlying possessions, according to the last preceding United States census: *Provided*, That the allotment of funds to any State shall be not less than a minimum of \$5,000 for any fiscal year prior to and including the fiscal year ending June thirtieth, nineteen hundred and twenty-three, nor less than \$10,000 for any fiscal year thereafter, and there is hereby appropriated the following sums, or so much thereof as may be needed, which shall be used for the purpose of providing the minimum allotment to the States provided for in this section: For the fiscal year ending June thirtieth, nineteen hundred and eighteen, the sum of \$66,000; for the fiscal year ending June thirtieth, nineteen hundred and nineteen, the sum of \$46,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty, the sum of \$34,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-one, the sum of \$28,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-two, the sum of \$25,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-three, the sum of \$22,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-four, the sum of \$19,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-five, the sum of \$56,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-six, and annually thereafter, the sum of \$50,000.

That not more than twenty per centum of the money appropriated under this act for the payment of salaries of teachers of trade, home economics, and industrial subjects, for any year, shall be expended for the salaries of teachers of home economics subjects.

SEC. 4. That for the purpose of cooperating with the States in preparing teachers, supervisors, and directors of agricultural subjects and teachers of trade and industrial and home economics subjects there is hereby appropriated for the use of the States for the fiscal year ending June thirtieth, nineteen hundred and eighteen, the sum of \$500,000; for the fiscal year ending June thirtieth, nineteen hundred and nineteen, the sum of \$700,000; for the fiscal

year ending June thirtieth, nineteen hundred and twenty, the sum of \$900,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-one, and annually thereafter, the sum of \$1,000,000. Said sums shall be allotted to the States in the proportion which their population bears to the total population of the United States, not including outlying possessions, according to the last preceding United States census: *Provided*, That the allotment of funds to any State shall be not less than a minimum of \$5,000 for any fiscal year prior to and including the fiscal year ending June thirtieth, nineteen hundred and nineteen, nor less than \$10,000 for any fiscal year thereafter. And there is hereby appropriated the following sums, or so much thereof as may be needed, which shall be used for the purpose of providing the minimum allotment provided for in this section: For the fiscal year ending June thirtieth, nineteen hundred and eighteen, the sum of \$46,000; for the fiscal year ending June thirtieth, nineteen hundred and nineteen, the sum of \$32,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty, the sum of \$24,000; for the fiscal year ending June thirtieth, nineteen hundred and twenty-one, and annually thereafter, the sum of \$90,000.

SEC. 5. That in order to secure the benefits of the appropriations provided for in sections two, three, and four of this act, any State shall, through the legislative authority thereof, accept the provisions of this act and designate or create a State board, consisting of not less than three members, and having all necessary power to cooperate, as herein provided, with the Federal Board for Vocational Education in the administration of the provisions of this act. The State board of education, or other board having charge of the administration of public education in the State, or any State board having charge of the administration of any kind of vocational education in the State may, if the State so elects, be designated as the State board, for the purposes of this act.

In any State the legislature of which does not meet in nineteen hundred and seventeen, if the governor of that State, so far as he is authorized to do so, shall accept the provisions of this act and designate or create a State board of not less than three members to act in cooperation with the Federal Board for Vocational Education, the Federal Board shall recognize such local board for the purposes of this act until the legislature of such State meets in due course and has been in session sixty days.

Any State may accept the benefits of any one or more of the respective funds herein appropriated, and it may defer the acceptance of the benefits of any one or more of such funds, and shall be required to meet only the conditions relative to the fund or funds the benefits of which it has accepted: *Provided*, That after June thirtieth, nineteen hundred and twenty, no State shall receive any appropriation for salaries of teachers, supervisors, or directors of agricultural subjects, until it shall have taken advantage of at least the minimum amount appropriated for the training of teachers, supervisors, or directors of agricultural subjects, as provided for in this act, and that after said date no State shall receive any appropriation for the salaries of teachers of trade, home economics, and industrial subjects until it shall have taken advantage of at least the minimum amount appropriated for the training of teachers of trade, home economics, and industrial subjects, as provided for in this act.

SEC. 6. That a Federal Board for Vocational Education is hereby created, to consist of the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Labor, the United States Commissioner of Education, and three citizens of the United States to be appointed by the President, by and with the advice and consent of the Senate. One of said three citizens shall be a representative of the manufacturing and commercial interests, one a representative of the agricultural interests, and one a representative of labor. The board shall elect

annually one of its members as chairman. In the first instance, one of the citizen members shall be appointed for one year, one for two years, and one for three years, and thereafter for three years each. The members of the board other than the members of the Cabinet and the United States Commissioner of Education shall receive a salary of \$5,000 per annum.

The board shall have power to cooperate with State boards in carrying out the provisions of this act. It shall be the duty of the Federal Board for Vocational Education to make, or cause to have made studies, investigations, and reports, with particular reference to their use in aiding the States in the establishment of vocational schools and classes and in giving instruction in agriculture, trades and industries, commerce and commercial pursuits, and home economics. Such studies, investigations, and reports shall include agriculture and agricultural processes and requirements upon agricultural workers; trades, industries, and apprenticeships, trade and industrial requirements upon industrial workers, and classification of industrial processes and pursuits; commerce and commercial pursuits and requirements upon commercial workers; home management, domestic science, and the study of related facts and principles; and problems of administration of vocational schools and of courses of study and instruction in vocational subjects.

When the board deems it advisable such studies, investigations, and reports concerning agriculture, for the purposes of agricultural education, may be made in cooperation with or through the Department of Agriculture; such studies, investigations, and reports concerning trades and industries, for the purposes of trade and industrial education, may be made in cooperation with or through the Department of Labor; such studies, investigations, and reports concerning commerce and commercial pursuits, for the purposes of commercial education, may be made in cooperation with or through the Department of Commerce; such studies, investigations, and reports concerning the administration of vocational schools, courses of study and instruction in vocational subjects, may be made in cooperation with or through the Bureau of Education.

The Commissioner of Education may make such recommendations to the board relative to the administration of this Act as he may from time to time deem advisable. It shall be the duty of the chairman of the board to carry out the rules, regulations, and decisions which the board may adopt. The Federal Board for Vocational Education shall have power to employ such assistants as may be necessary to carry out the provisions of this act.

SEC. 7. That there is hereby appropriated to the Federal Board for Vocational Education the sum of \$200,000 annually, to be available from and after the passage of this act, for the purpose of making or cooperating in making the studies, investigations, and reports provided for in section six of this act, and for the purpose of paying the salaries of the officers, the assistants, and such office and other expenses as the board may deem necessary to the execution and administration of this act.

SEC. 8. That in order to secure the benefits of the appropriation for any purpose specified in this act, the State board shall prepare plans, showing the kinds of vocational education for which it is proposed that the appropriation shall be used; the kinds of schools and equipment; courses of study; methods of instruction; qualifications of teachers; and, in the case of agricultural subjects, the qualifications of supervisors or directors; plans for the training of teachers; and, in the case of agricultural subjects, plans for the supervision of agricultural education, as provided for in section ten. Such plans shall be submitted by the State board to the Federal Board for Vocational Education, and if the Federal Board finds the same to be in conformity with the provisions and

purposes of this act, the same shall be approved. The State board shall make an annual report to the Federal Board for Vocational Education, on or before September first of each year, on the work done in the State and the receipts and expenditures of money under the provisions of this act.

SEC. 9. That the appropriation for the salaries of teachers, supervisors, or directors of agricultural subjects and of teachers of trade, home economics, and industrial subjects shall be devoted exclusively to the payment of salaries of such teachers, supervisors, or directors having the minimum qualifications set up for the State by the State board, with the approval of the Federal Board for Vocational Education. The cost of instruction supplementary to the instruction in agricultural and in trade, home economics, and industrial subjects provided for in this act, necessary to build a well-rounded course of training, shall be borne by the State and local communities, and no part of the cost thereof shall be borne out of the appropriations herein made. The moneys expended under the provisions of this act, in cooperation with the States, for the salaries of teachers, supervisors, or directors of agricultural subjects, or for the salaries of teachers of trade, home economics, and industrial subjects, shall be conditioned that for each dollar of Federal money expended for such salaries the State or local community, or both, shall expend an equal amount for such salaries; and that appropriations for the training of teachers of vocational subjects, as herein provided, shall be conditioned that such money be expended for maintenance of such training and that for each dollar of Federal money so expended for maintenance, the State or local community, or both, shall expend an equal amount for the maintenance of such training.

SEC. 10. That any State may use the appropriation for agricultural purposes, or any part thereof allotted to it, under the provisions of this act, for the salaries of teachers, supervisors, or directors of agricultural subjects, either for the salaries of teachers of such subjects in schools or classes or for the salaries of supervisors or directors of such subjects under a plan of supervision for the State to be set up by the State board, with the approval of the Federal Board for Vocational Education. That in order to receive the benefits of such appropriation for the salaries of teachers, supervisors, or directors of agricultural subjects the State board of any State shall provide in its plan for agricultural education that such education shall be that which is under public supervision or control; that the controlling purpose of such education shall be to fit for useful employment; that such education shall be of less than college grade and be designed to meet the needs of persons over fourteen years of age who have entered upon or who are preparing to enter upon the work of the farm or of the farm home; that the State or local community, or both, shall provide the necessary plant and equipment determined upon by the State board, with the approval of the Federal Board for Vocational Education, as the minimum requirement for such education in schools and classes in the State; that the amount expended for the maintenance of such education in any school or class receiving the benefit of such appropriation shall be not less annually than the amount fixed by the State board, with the approval of the Federal Board as the minimum for such schools or classes in the State; that such schools shall provide for directed or supervised practice in agriculture, either on a farm provided for by the school or other farm, for at least six months per year; that the teachers, supervisors, or directors of agricultural subjects shall have at least the minimum qualifications determined for the State by the State board, with the approval of the Federal Board for Vocational Education.

SEC. 11. That in order to receive the benefits of the appropriation for the salaries of teachers of trade, home economics, and industrial subjects the State

board of any State shall provide in its plan for trade, home economics, and industrial education that such education shall be given in schools or classes under public supervision or control; that the controlling purpose of such education shall be to fit for useful employment; that such education shall be of less than college grade and shall be designed to meet the needs of persons over fourteen years of age who are preparing for a trade or industrial pursuit or who have entered upon the work of a trade or industrial pursuit; that the State or local community, or both, shall provide the necessary plant and equipment determined upon by the State board, with the approval of the Federal Board for Vocational Education, as the minimum requirement in such State for education for any given trade or industrial pursuit; that the total amount expended for the maintenance of such education in any school or class receiving the benefit of such appropriation shall be not less annually than the amount fixed by the State board, with the approval of the Federal Board, as the minimum for such schools or classes in the State; that such schools or classes giving instruction to persons who have not entered upon employment shall require that at least half of the time of such instruction be given to practical work on a useful or productive basis, such instruction to extend over not less than nine months per year and not less than thirty hours per week; that at least one-third of the sum appropriated to any State for the salaries of teachers of trade, home economics, and industrial subjects shall, if expended, be applied to part-time schools or classes for workers over fourteen years of age who have entered upon employment, and such subjects in a part-time school or class may mean any subject given to enlarge the civic or vocational intelligence of such workers over fourteen and less than eighteen years of age; that such part-time schools or classes shall provide for not less than one hundred and forty-four hours of classroom instruction per year; that evening industrial schools shall fix the age of sixteen years as a minimum entrance requirement and shall confine instruction to that which is supplemental to the daily employment; that the teachers of any trade or industrial subject in any State shall have at least the minimum qualifications for teachers of such subject determined upon for such State by the State board, with the approval of the Federal Board for Vocational Education: *Provided*, That for cities and towns of less than twenty-five thousand population, according to the last preceding United States census, the State board, with the approval of the Federal Board for Vocational Education, may modify the conditions as to the length of course and hours of instruction per week for schools and classes giving instruction to those who have not entered upon employment, in order to meet the particular needs of such cities and towns.

SEC. 12. That in order for any State to receive the benefits of the appropriation in this act for the training of teachers, supervisors, or directors of agricultural subjects, or of teachers of trade, industrial or home economics subjects, the State board of such State shall provide in its plan for such training that the same shall be carried out under the supervision of the State board; that such training shall be given in schools or classes under public supervision or control; that such training shall be given only to persons who have had adequate vocational experience or contact in the line of work for which they are preparing themselves as teachers, supervisors, or directors, or who are acquiring such experience or contact as a part of their training; and that the State board, with the approval of the Federal Board, shall establish minimum requirements for such experience or contact for teachers, supervisors, or directors of agricultural subjects and for teachers of trade, industrial, and home economics subjects; that not more than sixty per centum nor less than twenty per centum

of the money appropriated under this act for the training of teachers of vocational subjects to any State for any year shall be expended for any one of the following purposes: For the preparation of teachers, supervisors, or directors of agricultural subjects, or the preparation of teachers of trade and industrial subjects, or the preparation of teachers of home economics subjects.

SEC. 13. That in order to secure the benefits of the appropriations for the salaries of teachers, supervisors, or directors of agricultural subjects, or for the salaries of teachers of trade, home economics, and industrial subjects, or for the training of teachers as herein provided, any State shall, through the legislative authority thereof, appoint as custodian for said appropriations its State treasurer, who shall receive and provide for the proper custody and disbursements of all money paid to the State from said appropriations.

SEC. 14. That the Federal Board for Vocational Education shall annually ascertain whether the several States are using, or are prepared to use, the money received by them in accordance with the provisions of this act. On or before the first day of January of each year the Federal Board for Vocational Education shall certify to the Secretary of the Treasury each State which has accepted the provisions of this act and complied therewith, certifying the amounts which each State is entitled to receive under the provisions of this act. Upon such certification the Secretary of the Treasury shall pay quarterly to the custodian for vocational education of each State the moneys to which it is entitled under the provisions of this act. The moneys so received by the custodian for vocational education for any State shall be paid out on the requisition of the State board as reimbursement for expenditures already incurred to such schools as are approved by said State board and are entitled to receive such moneys under the provisions of this act.

SEC. 15. That whenever any portion of the fund annually allotted to any State has not been expended for the purpose provided for in this act, a sum equal to such portion shall be deducted by the Federal Board from the next succeeding annual allotment from such fund to such State.

SEC. 16. That the Federal Board for Vocational Education may withhold the allotment of moneys to any State whenever it shall be determined that such moneys are not being expended for the purposes and under the conditions of this act.

If any allotment is withheld from any State, the State board of such State may appeal to the Congress of the United States, and if the Congress shall not direct such sum to be paid, it shall be covered into the Treasury.

SEC. 17. That if any portion of the moneys received by the custodian for vocational education of any State under this act, for any given purpose named in this act, shall, by any action or contingency, be diminished or lost, it shall be replaced by such State, and until so replaced no subsequent appropriation for such education shall be paid to such State. No portion of any moneys appropriated under this act for the benefit of the States shall be applied, directly or indirectly, to the purchase, erection, preservation, or repair of any building or buildings or equipment, or for the purchase or rental of lands, or for the support of any religious or privately owned or conducted school or college.

SEC. 18. That the Federal Board for Vocational Education shall make an annual report to Congress, on or before December first, on the administration of this act, and shall include in such report the reports made by the State boards on the administration of this act by each State and the expenditure of the money allotted to each State.

Approved, February 23, 1917.

SECTION 2.

[PUBLIC, No. 64, SIXTY-FIFTH CONGRESS.]

[H. R. 5949.]

AN ACT Making appropriations to supply urgent deficiencies in appropriations for the fiscal year ending June thirtieth, nineteen hundred and eighteen, and prior fiscal years, on account of war expenses, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following sums are appropriated, out of any money in the Treasury not otherwise appropriated, to supply urgent deficiencies in appropriations for the fiscal year ending June thirtieth, nineteen hundred and eighteen, and prior fiscal years, on account of war expenses, and for other purposes, namely:

FEDERAL BOARD FOR VOCATIONAL EDUCATION.

The appropriation provided by section seven of the act creating the Federal Board for Vocational Education, approved February twenty-third, nineteen hundred and seventeen, is also made available for printing and binding, law books, books of reference, and periodicals, and postage on foreign mail.

In any State the legislature of which met in nineteen hundred and seventeen and failed for any reason to accept the provisions of the vocational education act, as provided in section five of said act, if the governor of that State, so far as he is authorized to do so, shall accept the provisions of said act and designate or create a State board of not less than three members to act in cooperation with the Federal Board for Vocational Education and shall designate the State treasurer as custodian for all moneys allotted to that State under said act, the Federal Board shall, if such legislature took no adverse action on the acceptance of said act in nineteen hundred and seventeen, recognize such State board for the purposes of said act until the legislature of that State meets in regular session in due course and has been in session sixty days.

Approved, October 6, 1917.

PUBLICATIONS OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

Annual Report for 1917.

The Vocational Summary, published monthly by the Federal Board for Vocational Education (Vol. 1, No. 1, May, 1918).

Bulletin No. 1. Statement of Policies.

***Bulletin No. 2. Training Conscripted Men for Service as Radio and Buzzer Operators in the United States Army (International Code).**

Bulletin No. 3. Emergency Training in Shipbuilding—Evening and Part-Time Classes for Shipyard Workers.

***Bulletin No. 4. Mechanical and Technical Training for Conscripted Men (Air Division, United States Signal Corps).**

Bulletin No. 5. (Reeduc. Ser., No. 1.) Vocational Rehabilitation of Disabled Soldiers and Sailors.

Bulletin No. 6. (Reeduc. Ser., No. 2.) Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors.

***Bulletin No. 7. Emergency War Training for Motor-Truck Drivers and Chauffeurs.**

***Bulletin No. 8. Emergency War Training for Machine-Shop Occupations, Blacksmithing, Sheet-Metal Working, and Pipe Fitting.**

***Bulletin No. 9. Emergency War Training for Electricians, Telephone Repairmen, Linemen, and Cable Splicers.**

***Bulletin No. 10. Emergency War Training for Gas-Engine, Motor-Car, and Motorcycle Repairmen.**

***Bulletin No. 11. Emergency War Training for Oxy-Acetylene Welders.**

***Bulletin No. 12. Emergency War Training for Airplane Mechanics—Engine Repairmen, Woodworkers, Riggers, and Sheet-Metal Workers.**

Bulletin No. 13. (Agri. Ser., No. 1.) Agricultural Education—Organization and Administration.

Bulletin No. 14. (Agri. Ser., No. 2.) Reference Material for Vocational Agricultural Instruction.

Bulletin No. 15. (Reeduc. Ser., No. 3.) The Evolution of National Systems of Vocational Reeducation for Disabled Soldiers and Sailors.

***Bulletin No. 16. Emergency War Training for Radio Mechanics and Radio Operators.**

***Bulletin No. 17. (Trade & Indus. Ser., No. 1.) Trade and Industrial Education—Organization and Administration.**

Bulletin No. 18. (Trade & Indus. Ser., No. 2.) Evening Industrial Schools.

Bulletin No. 19. (Trade & Indus. Ser., No. 3.) Part-Time Trade and Industrial Education.

Bulletin No. 20. (Trade & Indus. Ser., No. 4.) Buildings and Equipment for Schools and Classes in Trade and Industrial Subjects.

Bulletin No. 21. (Agri. Ser., No. 3.) The Home Project as a Phase of Vocational Agricultural Education.

**All communications should be addressed to
The Federal Board for Vocational Education, Washington, D. C.**

*** Emergency war training for conscripted and enlisted men.**

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BULLETIN No. 18

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**TRADE AND INDUSTRIAL
SERIES No. 2**

Evening Industrial Schools

18 ISSUED BY THE
**FEDERAL BOARD FOR VOCATIONAL EDUCATION
WASHINGTON**

SEPTEMBER, 1918

**WASHINGTON
GOVERNMENT PRINTING OFFICE
1918**

FEDERAL BOARD FOR VOCATIONAL EDUCATION.

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FOREWORD.

This bulletin was prepared by Mr. L. H. CARRIS, Assistant Director for Industrial Education. It was first circulated in manuscript form among the State executive officers for vocational education and State directors of industrial and trade education in order to procure the benefit of their experience and assistance as well as furnish them advanced information to aid them in planning their evening school work for the year 1918-19. In the form here given this bulletin presents the concensus of opinion of those with experience as to the way in which evening classes can be most successfully established and maintained.

Acknowledgment is due to Mr. Wesley A. O'Leary both for his helpful criticisms and suggestions and for the free use of material from his monograph on short unit courses in evening industrial schools published as Bulletin No. 79 by the United States Bureau of Labor Statistics; to Mr. Lewis A. Wilson, director of vocational education for New York, and to the regional agents of the Federal board for advice and criticism.

Evening industrial training, like all other forms of vocational education carried on under public auspices, is still in the experimental stage. With the rapidly growing experience of the many evening classes now being established under the vocational education act, this bulletin will need to be revised from time to time or supplemented by other bulletins so that the publications of the Federal board for the instruction through evening trade extension classes may be kept at least abreast of the best thought and most approved practice of the country.

C. A. PROSSER, *Director.*

EVENING INDUSTRIAL SCHOOLS.

INTRODUCTION.

PURPOSE OF THE BULLETIN.

The purpose of this bulletin is to describe possibilities in evening industrial school work under the provisions of the Smith-Hughes Act, and to give suggestive courses which have been prepared and carried out in certain evening schools where effective work has been done. It will also give approved methods of establishing and conducting evening industrial schools for trade workers.

The Federal board being charged with the promotion of vocational education in the several States in cooperation with State boards, has been frequently asked for suggestions regarding desirable courses and methods of instruction in evening classes. This bulletin is intended to cover those phases of evening school work which have been frequently brought to the attention of the staff of the board since its organization.

The success of an evening industrial school depends upon the care which is taken in its establishment and the methods by which it is conducted which presupposes an understanding of community needs, industrial needs, and individual needs, and an arrangement of courses both in content and method of presentation which will satisfy those needs.

This bulletin presents as suggestions some phases of the experience of certain cities in establishing and maintaining evening classes for industrial workers.

OPPORTUNITIES FOR EFFECTIVE WORK.

The opportunities for effective work in evening schools are many. As a matter of fact, probably more people can be reached in evening schools than by any other form of vocational education. The census of 1910 shows that the total number of people gainfully occupied in the United States numbered 38,167,336. Of these 30,091,564, or 78.8 per cent were males, and 8,075,772, or 21.2 per cent were females.

Of the total number, 10,658,881, were engaged in mechanical and manufacturing industries, and of these 8,837,901, or 82.9 per cent were males, and 1,820,980, or 17.1 per cent were females.

Large numbers of people engaged in industry are employed in a variety of occupations differing greatly as to the skill and knowledge demanded of the worker. As individuals they represent also the greatest possible variety of interest, mental aptitude, manual dexterity, ambition, previous schooling, and all other qualities and conditions which must be taken into consideration as factors in any attempt to reach them with vocational training. While some of these workers can be reached by the all-day and part-time schools, most of them must be trained for their work, if at all, after they have left the school to become breadwinners. The problem of reaching these workers and training them for increased industrial efficiency is then the great task of the evening industrial school.

Evening schools for industrial workers are a part of the movement to extend opportunities for education to all persons of any age who need it, which movement has become widespread in this country during the last 25 years. The Department of Agriculture of the United States has been engaged in carrying on a wonderfully large program of extension work. Hundreds of county farm demonstration agents are at work in agricultural counties helping to educate the adult farmers for more advantageous work in their callings. Large sums of money are available for this extension work. Many colleges and high schools have organized extension work, sometimes at the college itself and sometimes at distant centers, for the purpose of bringing as near as possible to the doors of persons ambitious to secure added education the facilities of the institution. Evening high schools have been organized to assist ambitious workers to supplement their general education. Many private foundations have organized evening work industrial in character. The provision of the Smith-Hughes Act, then, which provides a sum for evening industrial work, is just another evidence of this widespread movement for adult education.

The Federal plan for vocational education is, however, more specific in its intent than has been the case with most other types of extension education, since it limits evening industrial schools to giving instruction which is supplemental to day employment. The purpose of this restriction sometimes is not well understood and may seem, at first sight, difficult to put into practice. It is frequently argued that schools in order to be democratic must be open to any and all applicants. It has been customary to attempt in evening schools the preparation of persons for a particular employment in what may be termed "trade preparatory classes." Such classes have been mixed groups of persons, some having had experience in the practice which is taught in the class, and others no experience. Persons of maturity have been mixed with boys and girls little over 14 years of age. Schools so organized are just the opposite of democratic. A democratic government implies an effort to meet the needs of all the indi-

viduals making up the democracy. Under it the needs of individuals must be given full consideration, and no educational device of universal application to individuals can be imagined; therefore, wherever a group can be found with a common need which can be met through the organization of a school or class, the purpose of which is to give instruction to meet this common need, there and there only is the beginning of a school which is truly democratic.

Boards of education, school superintendents, and principals are considering more than ever before the educational system of a city as meaning something more than the provision of education for immature people, even though the public-school system carries students through the high school. Democracy demands a more generous provision of educational facilities for all persons who are residents of the community and who are desirous of improving themselves, either through the acquisition of a general education or of knowledge which can be applied to a specific occupation. No other form of school activity has more public opinion and support back of it than evening vocational work. This evening vocational work seems to the business or professional man to be practical in the extreme, to meet a real need, and to be worth all that it costs.

FUNDS AVAILABLE.

The funds available for trade and industrial education may be used to the extent of two-thirds of the entire amount available, at the discretion of the State Boards for Vocational Education, the only restriction being that one-third of the entire amount available must be expended, if expended at all, for part-time instruction. State boards may use not to exceed 20 per cent of the entire sum for home-economics subjects. This is discretionary. The point which it is here desired to emphasize is that two-thirds of the fund is available for evening-school instruction or for day schools or classes. It is, therefore, the duty and the responsibility of the State board to decide what proportion of this money shall be used for day schools and what part shall be used for evening schools.

GENERAL AND VOCATIONAL EDUCATION.

Any discussion relating to a form of industrial education proposed for financial support from Federal funds must distinguish clearly between general education and vocational education. The Federal funds are intended, when used in an evening school, to fit for useful employment only persons who have already made a vocational choice and who are already engaged in the vocation of their

choice. In the conduct of evening schools generally no clear distinction or division is commonly made between classes designed to promote efficiency and classes designed to extend general education. Only words of praise are to be given to any effort which boards of education may make to establish evening schools which satisfy specific needs, whether vocational or general. It would be difficult to catalogue all of the activities which have been carried on in evening schools. Evening classes have been conducted to give instruction in elementary school subjects to persons who have not completed these subjects in the day schools. Algebra, geometry, chemistry, physics, Latin, French, and German have been and are being taught in evening schools. These classes have been attended by persons who desire to complete a high-school education either for the purpose of qualifying for entrance upon the preparation for a profession or for the purpose of extending their general knowledge and information. Evening-school classes have been organized to teach English to foreigners in order that we may have a more loyal and effective citizenship. Evening classes in candy making and handcrafts such as embroidery, tatting, pyrography, leather work, weaving, basketry, and clay modeling have been successfully conducted.

Cities with public-school gymnasiums have thrown them open in order that the men and women of the city might secure physical education. Evening classes in dancing, military drill, and calisthenics, have been conducted. Courses in dramatics, the organization of amateur athletics, the training in orchestral work, chorus singing, evening piano lessons and voice culture have been undertaken. The forms of evening school work above mentioned and many others which might have been named, may be said to fall within the province of general education.

In the field of evening vocational work, classes have been organized to teach such subjects as stenography and typewriting, machine-shop work, electrical work, carpentry, cabinetmaking, plumbing, machine operating, and dressmaking. Such classes, in turn, may be classified as either trade extension or trade preparatory, in accordance with the day experience of the pupils which make up the class. If the pupils have had no experience in the industry or trade in which instruction is given, the school or class may be said to be trade preparatory. For example, a group of young men composed of bookkeepers from an insurance company, stock clerks from a department store, motormen from a public railway system might be organized to learn machine-shop work. This class would be a *trade preparatory class* in machine-shop practice. The *trade extension evening class* takes men or women from a given trade or industrial pursuit and attempts to teach them in short intensive courses in evening schools,

either knowledge or skill in the manipulation of tools of the trade or industry in which they are engaged, or the related subjects of the industry, such as science, drawing, and mathematics, which will prove a valuable asset to them in the occupation which they have chosen and upon which they have entered.

The Federal act provides for financial aid only to the type of evening schools concerned with trade extension education. This bulletin, therefore, discusses in detail only evening trade extension industrial schools or classes.

SCOPE OF THE BULLETIN.

The provisions of the Federal act relating to evening schools may be briefly resumed as follows: An evening industrial school or class established under the provisions of the Federal act is a school or class established and maintained under public supervision or control in any community for the purpose of giving instruction supplemental to the day employment to persons over 16 years of age who have entered upon employment in a particular trade or industrial pursuit. It must be conducted in accordance with the plan adopted by the State Board for Vocational Education and approved by the Federal board, which plan shall show adequate provisions for (a) necessary plant and equipment; (b) minimum annual maintenance; (c) courses of study to be used; (d) methods of instruction; (e) qualifications of teachers, who shall have had experience or contacts in the occupations they are to teach.

The term "evening school work" is considered by the Federal board to mean school work given to persons at hours other than those of actual employment. "Evening schools" then becomes a generic term descriptive of the kind of work rather than of the particular time of day when the class is in session. Persons working in night shifts could be taught in classes held in the morning or afternoon. Where Saturday half holiday is maintained the class might be in session at that time. It could even be held on Sundays or at times of stated nonemployment or in periods of inclement weather.

The foregoing general provisions are noted here in order that the reader may have clearly in mind the definition of an evening industrial school. This bulletin is not concerned with legal standards and measurements; neither does it attempt to give all of the provisions of the Smith-Hughes Act relating to evening industrial schools, nor an interpretation of these provisions. These matters are discussed, however, in the bulletin on the organization and administration of trade and industrial education (Bulletin No. 17), which may well be read in connection with this bulletin.

The sections following deal with approved practice in the evening industrial school work rather than with administration, and the following topics are discussed in the order indicated:

1. Pupils.
2. Courses of study.
3. Teachers.
4. Methods of instruction.
5. Buildings.
6. Equipment.
7. Organization and conduct.
8. Responsibilities, opportunities, and duties of possible cooperative agencies.

These are the component factors of an evening school; upon their interrelation and coordination depends its success. How to organize these and how to teach the trade worker so that the instruction may be actually supplemental to his day employment requires constant attention to all these elements, and a clear understanding of needs, aims, and methods. Suggestions made under each topic are not to be regarded as finalities. In this type of education we are still in the pioneer experimental stage; there are no fixed practices applicable to all situations, and it is hoped that those charged with the administration of evening schools will always approach the task in the attitude of learners rather than of those with an educational panacea.

1. PUPILS.

Any school or class must be organized to give instruction to individuals. The only way that any school can be successfully organized is to ascertain the actual needs of the individuals who are to receive instruction. Especially is this true in the case of any attempt to give education to mature persons. Therefore in considering the pupils who may make up evening industrial school classes we need to know their aims, or why they come to an evening school; the time which they have available for the work; their age; their entrance qualifications; for what periods they can attend, and how they may be grouped for instruction.

AIMS OF PUPILS.

Classes may be recruited from all persons over the age of 16 engaged in trades or industrial pursuits. The large number of such persons, and the great variety of their employment invalidates any attempt to generalize concerning their aims in attending classes.

Prospective students may be roughly classified into two groups: First, those who know what they wish to secure from the school; and second, those whose experience has been such that they must

depend upon the school for guidance as to what courses are best calculated to increase their efficiency and enable them to advance in their calling. The great variety of employment and individual capacity makes impossible any scheme of vocational training which attempts to deal with workers in the mass. Only by studying the workers and classifying them into groups according to their needs can they be effectively trained. It may be said, however, that in general the workers who attend evening industrial schools will have "knocked around" more or less from one shop to another, and have learned by experience what the trade demands of them and what are their trade deficiencies. They know what things are assets and what are not. They have been encountering varying industrial conditions and have learned what they must do to meet them. Their maturity and experience have developed judgment which, with a knowledge of their needs, enables them to select from the work of the school the courses which best meet their needs. They come in search of instruction which they can use in their trades and which leads to better pay or promotion in those trades.

TIME AVAILABLE.

The men and women who are engaged in trade or industrial pursuits almost always work long hours at tasks which require physical strength. They can give only a few hours a week to the school which meets in the evening. Not infrequently they have families to support. Economic necessity presses hard upon them and forces them to increase to the utmost their earning capacity. They have only limited time in which to secure something on which they can realize in their trade. Unless the school is prepared to give them something on which they can realize, it fails.

The amount of time available will depend upon the character of the pursuit in which the pupil is engaged during the day and upon his working hours. A careful study should be made of the prevailing shifts in the community, and the school hours should be arranged accordingly. At the present time of high pressure it is customary to work two or three shifts during the 24 hours, and if a large number of persons are employed in night shifts there is no reason why evening classes should not be organized, to be held in the afternoon or even in the morning, since, as has been explained, the term "evening school" is a generic term, not to be taken to mean literally after 6 o'clock in the evening or after sunset.

The time of the trade worker being thus limited, the school must not waste it. In many industries he still works more than eight hours a day, and in others he is frequently called upon for overtime. He often lives at a distance from his work and the school and loses

much time in coming and going. The trade extension school, therefore, ought to conserve his time in every possible way. This it can do, as will be explained later, only by eliminating from the course all subjects not necessary as a means of increasing the pupil's trade efficiency, by so organizing the work that he can easily get what he needs and by employing direct and efficient methods of teaching.

GROUPS TO BE REACHED.

Generally, then, the pupil who comes from the trade is a mature worker, who realizes his deficiencies. Ordinarily he does not enroll in an evening industrial school until he has had one or more year's experience.

As has been pointed out the variety in individual employments and the differences in individual capacity make difficult a classification into groups, such as is necessary for instruction purposes. Such a grouping is, nevertheless, essential for effective work.

Evening industrial schools have proved successful in reaching such groups of workers as the following:

(a) Specialized machine hands, who, while running one machine wish to learn how to operate another; such as, for example, the planer hand, who wants to learn to operate the universal grinder.

(b) Skilled workmen, who because of the progress of their trade find themselves lacking in a small but necessary body of knowledge required to meet new demands in their trade; such as, for example, the printer who needs instruction as to how to match colors, and how to "doctor" ink; or the piano tuner, who wishes to learn the construction and mechanism of the player piano.

(c) Operatives or workers in the low-grade skilled and unskilled occupations, where there are "tricks of the trade" to be taught, and best ways of doing things which the shop is not organized to teach. This sort of instruction commonly calls for brief courses and for concrete, direct, and specific treatment of subject matter.

(d) Workers on specialized jobs, desiring instruction to meet requirements on the next job in line of promotion; such as, for example, the cleaner or finisher in the dress and waist industry who wishes to be an examiner or cloth inspector. The unit courses in rod making in the furniture industry given to machine hands to qualify them to become cabinetmakers also illustrates this type of work.

(e) Groups of men in a skilled occupation, who are desirous of taking training brief and direct in character, but who can not be induced to take extended courses.

(f) Persons engaged in skilled occupations, who wish to take instruction in subjects related to their trade, such as related drawing, science, or mathematics.

(g) Persons of superior training and ambition, who are willing and able to carry out a course of study extending over 2 or 3 years. Such a group can probably be recruited only in cities of considerable size or with an extensive leading industry.

Study of the needs of such groups of workers as are mentioned above will suggest methods of meeting these needs. Some of the methods already in use, particularly those dealing with the more ambitious, better prepared, and more special workers engaged for the most part in highly skilled trades have long stood the test of experience.

MINIMUM AND USUAL ENTRANCE AGE.

According to the provisions of the Smith-Hughes Act the controlling purpose of evening industrial schools is to fit for useful employment persons over 16 years of age who have entered upon the work of a trade or industrial pursuit. Generally in evening industrial schools the entrance age of pupils will be considerably higher than the minimum required by law. Average age thus far has, in fact, usually been around 23 or 24. The maturity must be taken into account at every step since the character of instruction, methods of organization, and discipline must be such as will attract and hold adult workers.

The fact that the instruction must be supplemental to the daily employment is a limitation tending to raise average age of pupils, because in many of the States youths are not permitted to enter most mechanical trades until the age of 16, and do not, in fact, commonly take up such employments until a more advanced age. Moreover, the worker does not commonly appreciate the need for instruction until he has been at work for some years.

In a word, the men and women to be reached by evening industrial schools are no longer adolescents. Their maturity and experience have developed judgment based upon a first-hand knowledge of their trades. Upon the school rests the responsibility of offering practical courses. The workers must be convinced of the value of the courses. They will come to the school in search of instruction which they can use in their trades, and if they can not be shown that the instruction differs from that given to immature pupils in the day or general evening school they will be skeptical of its value to them.

ENTRANCE QUALIFICATIONS.

Experience in a vocation should be the chief qualification for entrance into evening industrial classes. The mechanic often lacks formal schooling. Frequently he has not gone further than the sixth or seventh grade. His lack of schooling, together with the

fact that such schooling as he has had is too remote to be readily recalled, means that the scholarship standards of the evening industrial school can not be the scholarship standards of the day school or of the general evening school. Evening industrial courses should, therefore, not be based upon regular school standards for admission, since the requirement of an ordinary school examination would automatically shut out workers for whom the training is specially designed. The only standard for admission should be a man's fitness to profit by trade instruction.

Since the fitness to profit by the trade instruction given is the only entrance qualification which should be demanded, it will be necessary to select persons with approximately the same amount and kind of trade experience. This selection is an important part of the administration of an evening industrial school, and will be dealt with later in the bulletin under the subject "Organization and conduct" of evening industrial schools.

DURATION OF COURSES.

Experience goes to show that evening schools can hold the majority of their pupils for relatively short periods of continuous instruction, usually not longer than a year. Many pupils will be unable to attend regularly even for a full year. The trade worker shifts about from community to community. Many workers, like those of certain nationalities in the textile industry, are migratory; others, as for example, mechanics in the building trade shift from place to place with the demand of the labor market. In view of these limitations, except in the rare cases where it is clear that an unusually ambitious group can be held together, the work for evening industrial schools must be given in units extending over relatively short terms, keeping it always in mind that whenever possible there should be a sequence of courses, which will enable the few who can give the time required to secure as complete a training as possible.

No minimum or maximum number of hours instruction is provided in the Federal act. Some States provide by law that evening schools must be in session for a stated minimum number of nights if the districts maintaining them may participate in school funds. This organization for a given number of nights, say 80 or 100, need not interfere with the organization of the school in accordance with the suggestions contained in this bulletin, since a series of units can be organized to be given within the period required for the maintenance of evening schools, and the school can deal with successive groups of workers, of whom a number will probably begin the work and continue it throughout the year with successive groups. Short courses

can be arranged in a sequence, of which workers may take as many as may be advantageous for them.

While the Federal board believes that an evening school can best be conducted in the manner indicated above by taking into consideration the limited amount of time available, it wishes to point out at this place that the length of the courses offered will not be made a measure of their approval. Practically the only requirement, other than that of age, is that the instruction shall be supplemental to the daily employment. It is important, however, that a community should make a careful study of the needs of its own workers and should arrange evening courses so as to reach the largest possible number.

2. COURSES OF STUDY.

Given a group of trade or industrial workers seeking instruction to better fit them for their work, what work shall be given?

The answer to this question gives the courses of study. It will be evident, when the very large number of trade or industrial pursuits for which it is possible to give supplementary instruction is taken into consideration, that this bulletin can deal only with general guiding principles. In the appendix, however, will be found a number of courses which have been tried successfully, and which serve to illustrate specific applications of the general principles indicated here.

The sections following undertake an explanation of the term "supplemental to the daily employment," a consideration of the relative values of short and long courses, and a consideration of the modifications necessary to meet particular needs of individuals.

SUPPLEMENTAL TO THE DAILY EMPLOYMENT.

This term has many times been misunderstood. On first consideration it seems to narrow the scope of evening school work by excluding from evening industrial classes persons not engaged in the specific occupations for which supplemental instruction is given. To understand the term it may be well at this place to consider briefly the two kinds of evening industrial school work possible. First, some schoolmen advocate the teaching in evening schools of the beginnings of a trade to any group of persons whatever their day employment. Evening industrial classes of this type are usually known as trade preparatory or trade changing classes. Where instruction is supplemental, it is known as trade extension, and it is this latter only which can receive any benefits from the funds provided for distribution to the several States under the Smith-Hughes Act.

There must be no vagueness of aim in the evening industrial school giving trade extension work. Its aim is to provide instruction supplemental to the daily employment which will prove a trade asset to the person taking the work. This bulletin need not go into any extended discussion concerning trade changing courses and trade preparatory courses, since the act itself limits the work which may receive Federal aid to one type of evening classes only, namely, trade extension classes. Trade changing courses are designed for persons who wish to change from the trade or occupation they are in to some other which they believe they can pursue with greater success. These trade changing courses are similar to trade preparatory courses, the only difference in practical conduct being that the trade preparatory courses are usually attended by more immature persons who have followed no trade or calling which has any opportunities for advancement.

A trade extension evening industrial school must distinguish between courses that are an integral part of the trade, and those that have only an incidental relationship to it, as for example, courses in motor construction for machinists, and courses in the same subject for electricians.

It has been demonstrated repeatedly that satisfactory teaching in a trade subject can not be done in a class which is not organized on the basis of a common trade experience. It would be impossible, for example, to formulate a course for a class in machine-shop practice to which were admitted machinists, chauffeurs, engineers, and pattern makers, for the reason that their trade experience has been so varied that there is no common basis for instruction.

To clarify the aim of instruction for women as well as for men, the various groups to be taught should be segregated and organized on the basis of the purpose for which the instruction is intended. Courses in the diversified duties connected with the maintenance and care of a home and family, such as general housekeeping, household accounting, house furnishing, marketing, home nursing, cooking, and sewing, should be formulated from the standpoint of the factors of experience common to the groups of homemakers for which each course is prepared. It should satisfy their desires as well as meet their needs. These classes should be taught by women of practical experience, with a mastery of the subject, an intimate knowledge of the types of homes represented, and a sincere sympathy for the complexity of the problems which must be faced by the mother or the manager of a home. Trade courses for women on the other hand, like trade courses for men should be organized from the standpoint of the needs of the trade worker and the requirements of the industry. A course in sewing that would be adapted to home use would probably fail to meet the requirements of trade work.

THE COURSE MUST MEET THE NEEDS OF PARTICULAR GROUPS.

It follows from the requirement that instruction shall be supplemental to the daily employment that the course of study shall be formulated to meet the needs of particular groups. These needs can be uncovered only by a study of the industries in the community, and of the opportunities for instruction provided by the industries themselves, and by ascertaining the number of persons who are anxious for self-improvement. When these things have been ascertained it is not difficult to formulate a plan for work. Nevertheless, the course as finally prepared should be used only as a guide. The variety of experience and ability developed in any particular group of pupils will necessitate individual instruction, and the success of the class will depend in a large measure upon the teacher's ability to meet individual needs after the group has begun work. The course of study chosen for a particular group should definitely state the particular parts of a trade to be taught, and should leave much latitude for instruction in the actual conduct of the class. The course of study may be likened to the charting of a sea route from one port to another. There is definitely laid out the route and its terminals, but owing to the variations of wind and weather, current and tide, it is necessary for the captain of the ship to make daily observations and calculations in order to know where he is and to direct his ship according to the results of the calculations he makes as the result of the data secured from these observations. The course of study charts the sea of experience to be covered from the port of little experience in the trade to the port of greater experience, and the instructor, like the captain, must make his daily observations and from these observations must calculate and set down in lesson plans the daily direction he must give to his class.

LONG AND SHORT TERM COURSES.

The Federal act sets neither the maximum nor minimum number of hours for evening school instruction, and the Federal board leaves it entirely to a State board of education to determine what shall be the length of the course of instruction. It is clear that the length for which it should be planned will depend upon several factors. Among these are:

(a) *The size of the community and the number of workers in the trade.*—In the larger cities it is possible to recruit sufficient numbers of trade workers for evening school classes to make relatively easy a segregation into groups with a common trade experience. Under these conditions it is possible also to organize both long and short courses and to provide for a sequence of short courses extending over a year or more, thus providing work for those who can attend school

for a limited period only, as well as for those who can give up a number of evenings for a longer period of time.

(b) *The character of the occupation taught.*—The trade and related subject content of some semiskilled and unskilled industrial employments is not sufficient to warrant the organization of courses extending over long periods, but in these cases supplemental instruction can be given in short courses. The content of skilled trades is such that it can be given in longer courses, sometimes of one, two, or three years. Even in the case of the most highly skilled trades, however, the instruction can be broken up into short units, requiring relatively short periods of attendance.

(c) *The character of the work given.*—In certain cases it may be possible to organize evening industrial work which is supplemental to the work in certain allied occupations, such as, for example, the interpretation of architectural drawings for men employed in the various building trades. This course might be given to advantage in a longer term than would be possible if the course were given to teach a particular part of one of these trades, such as, for example, saw filing for carpenters. Usually the subjects which may be called related subjects, such as drawing, mathematics, and science, can be organized for a greater number of nights than can particular phases of shop work dealing only with special operations.

(d) *The availability of sufficient and satisfactory equipment.*—It is only in the larger cities that there can be found the variety of equipment necessary to make available a sufficient number of different machines to enable classes to be organized for effective work in a large number of subjects. The typical school machine shop, for example, available for evening industrial work would necessitate the organization of longer terms with provision for individual instruction. In this connection the merits of short courses should not be lost sight of. Since the instruction must be largely individual, students should be welcomed up to the limit of the machines available, and can be wished Godspeed after they have secured a reasonable degree of skill in the use of a particular machine, even if they have attended for a few nights only. In other words, when a course is organized probably with the use of only a general shop equipment, the registration for the work should be a continuous process, and the completion of the units of work will be of frequent occurrence.

SHORT UNIT COURSES.

The Federal board believes that no matter what the length of the term may be, the most effective course or study can be organized on the basis of short units. The "short-unit course" is recognized as a relative term, and may be used to describe, for example, a

course in testing and experimenting on lubrication for automobile mechanics which could be given in 5 lessons; and, also, a course of 100 lessons in elementary building construction drafting for architectural draftsmen.

While there should be, wherever possible, a series of short courses arranged in a progressive sequence, nevertheless each of these is a series of lessons and should be a complete unit in itself. Each unit should be open to all workers who can prove themselves, from their experience, capable of doing the work of that particular part of the series regardless of their prior school attendance. Promotion on completion of any part of evening industrial work should be based upon trade efficiency only.

Teaching the worker from the standpoint of deferred values means present preparation for assumed future needs. Instruction which does not draw its subject matter from experience always tends to become abstract. The average industrial worker is not fitted either by experience or by training to acquire knowledge through abstract instruction. Moreover, he usually comes to the school for the purpose of meeting a present and not a future need, and he will not often submit to the preparatory drill which always accompanies teaching from the standpoint of deferred values. These immediate values can be given by means of the short unit courses. The short unit course puts up a trade asset when it includes only what has been passed upon by men in the trade and found to be of practical value; and when material thus selected is taught by a practical teacher with reference to its adaptability to the trade needs of the particular group for whom the course is intended. The various courses in machine-shop mathematics, given in the appendix, illustrate how courses in this subject, under the short unit system, can be made of practical value to the worker. These courses, it will be understood, need not be used in exactly the form in which they are given here, but can be modified to meet specific requirements.

Courses organized as short units economize the time of the pupil by eliminating all unnecessary preparatory work and all work that does not apply to his specific need, and by arranging a flexible program that will permit him to begin his work at the point of his greatest need. If he is a draftsman and wants to understand the meaning and use of formulas, he is not compelled to take first a general course in algebra.

The worker in the trade who has had a limited academic training is, therefore, not excluded from the short unit course on account of his lack of schooling. He is admitted on trial to the course on the basis of his previous experience, the nature of his need, and his probable ability to profit by the instruction. These should be

determined by a conference between the prospective pupil and the instructor.

In some cases admission requirements to a particular course may be satisfied by knowledge gained through occupational experience, while in others it may have been gained in previous courses taken. When the interview between instructor and pupil discloses that the fundamental knowledge has been acquired in either way, the applicant should be admitted.

Courses planned on the basis of long and continuous attendance frequently fail to meet the needs of the industrial worker because, first, many workers hesitate to enroll for a long course who would be attracted by a short course; and, second, because the instruction in long courses is likely to proceed in too leisurely a manner, which repels the student who feels that he is not getting what he wants quickly enough, whereas the short course compels direct and intensive teaching, and satisfies the demand on the student's part for immediate utility. For both of these reasons the average attendance upon a series of short unit courses is likely to be better than upon a long term course.

The short course recognizes this situation and meets the difficulty (1) by making the unit so small that the pupil will be able to complete it within the time the school can probably hold him, and (2) by dealing with one specific thing in each course. Organizing the course as a short unit makes the instruction complete as far as it goes, and therefore more effective. If the unit course is laid out for 10 lessons the pupil who remains through the course gets all the school has to offer upon the specific topic, which is probably much more than he would get from 10 lessons in a course on the same subject laid out to cover a year. By limiting the course to one specific thing, the effort of the pupil is concentrated upon one subject instead of being dissipated among several, as it would be in the general course. This results in more regular attendance, in more intensive work, and in a corresponding gain in efficiency.

Experience shows that short unit courses arranged in sequence hold pupils in school better than do the long courses, and that the knowledge of a definite accomplishment is an incentive to further attendance.

Furthermore, courses organized under the unit system enable the school to discover new groups to be served. In every community there is always a great deal of vagueness as to what the school is doing. Many whom the school should serve are never reached, because the courses have been advertised in such general terms that workers do not understand what definite aims are comprehended. If unit courses are offered in terms of probable group needs, and advertised in language that is readily understood by the workers

they are intended to serve, new groups will be discovered whose existence has been unsuspected.

In a word, the unit system is flexible. It meets the needs both of the worker who wishes help in some particular requirement of his trade, but who can not take an extended course and of the worker who wishes a complete course. The pupil can break in to the work at the point of his need, get the help he seeks, and then withdraw. If he has other needs, to satisfy them he has only to repeat the process, and by taking units enough he can get a well-rounded training.

COURSES EXTENDING THROUGH THE YEAR.

Although the Federal board believes that the short unit course as above described provides the most satisfactory course of study and form of organization for an evening industrial school, it realizes that some schools have been successful in giving trade-extension courses extending over relatively long periods. The suggestions so far given can, however, be used in formulating a course of any length. Whether a course is prepared for a few nights or for a large number of nights, a careful analysis of the occupation for which supplementary instruction is to be given is absolutely necessary. In the case of a short-unit course one particular part of the trade is taken as the basis of the course. In the longer course there may be an attempt to include many of the operations, and in fact it may be planned to cover an entire trade or occupation. The problem, then, really becomes one of selecting the skills and knowledge which are to be developed and of determining upon an appropriate teaching sequence. The longer course is written for a group which is expected to stay in school for a considerable period and do consecutive work. In many of the successful evening industrial schools organized on a basis of one or more years' instruction there is the greatest freedom as to registration and attendance, and a careful study is made of the trade assets of the prospective student before he is placed in the course.

COURSES FOR PERSONS FROM CLOSELY RELATED TRADES.

Sometimes on account of the small size of the community where evening industrial work is to be given it will be impossible to secure a large-enough enrollment to warrant the establishment of an evening school class in a particular trade. It may be possible to arrange a course which will give instruction supplementary to the daily employment to persons from closely allied occupations, but the fundamental consideration must be kept in mind that all instruction in the evening schools under discussion must be of demonstrable value in

the daily occupation to the pupils taking the work, i. e., the work must be truly supplemental.

An example of this kind of a course may be taken from the group of building trades. It is entirely practicable to arrange a course in reading architectural drawings for carpenters, masons, bricklayers, plumbers, and electricians which would provide instruction of value to a class composed of men from all of these trades. It would, of course, be understood that the aim of the course would not be to make draftsmen but to enable the carpenters, masons, bricklayers, plumbers, and electricians to learn to read and to understand the drawings which are used by them in their daily work. Another illustration might be taken from the drafting trades themselves. In every large or even moderately large industrial community there are a large number of persons engaged in drafting as an occupation. There are architectural draftsmen, machine-shop designers, draftsmen for cabinet work, for electrical and for other kinds of work. Here the finer technique of drafting can be made the basis of work and the aim can be that of improving the men in their daily occupation of drafting in any of its various branches.

KINDS OF WORK TO BE PROVIDED.

There are two kinds of vocational work possible in an evening industrial school; namely, shopwork and related-subjects work. The former requires an equipment adequate in amount and modern in character, and is largely concerned with the actual handling of machines and the manipulation of materials. The latter is concerned with a consideration of the related science, drawing, and mathematics. The first is concerned with the "how," the second with the "why." The second can be given with little equipment and in an ordinary classroom.

SHOPWORK.

It is not required by the Federal act that the course of study in an evening school shall plan for practical work on a useful or productive basis. Much successful evening instruction can approximate this kind of work but it is to be borne in mind that persons taking shopwork in an evening school are actually engaged in production on a scale which the school can not and should not undertake. The evening-school shopwork can be conducted on the exercise basis to a much greater extent with better results than is advisable in a day school, since the pupils in attendance are familiar with the productive side, and desire to perfect themselves in particular operations or to learn new ones which will lead to opportunities for promotion or to a greater round of experience in the chosen trade.

It is not intended to convey the impression that related work and shopwork for evening schools are mutually exclusive terms. In every well-conducted evening-school shop much related-subjects work is taught both by individual and by group instruction. The machines may be stopped and the men given short talks on basic principles which should be understood by all. The shops are often equipped so that the men in attendance can be called to a corner of the room, where a blackboard is available, where sketches may be made and explained, and where mathematical calculations of interest and value to the pupils may be undertaken.

RELATED SUBJECTS WORK.

If the occupation for which evening school instruction is to be given requires mathematics, drawing, or science, for a workman to be known as a master of his trade, it is possible and desirable to give courses in these subjects. It is not to be understood from this statement, however, that any of these subjects as ordinarily formulated in secondary schools can be given in an evening industrial school. It would be hard to find a trade or industrial pursuit, for example, which would require a knowledge of algebra through quadratics, such as is required in college entrance examinations, or a knowledge of demonstrational geometry, or of trigonometry, or of calculus. There are, however, trades which use facts taken from these branches of mathematics. Problems and demonstrations selected according to their usefulness in specific trades may be properly considered as constituting the mathematics of those trades, and may be taught in evening classes. Similarly there are facts in science which may be organized in courses of trade science. Such courses, organized by the instructor, must be adapted to the needs of the group being taught.

STUDY OUT OF HOURS.

There will always be found in large industrial communities a considerable number of workers engaged in a trade or industrial occupation who are able, either through previous training or through perseverance to do independent work. An evidence of this is the large enrollment in correspondence schools and the completion of courses of study under adverse conditions. Such correspondence courses are given under public auspices by the university extension department of the Massachusetts Board of Education, by Dunwoody Institute, by extension departments of the universities of Wisconsin and Minnesota, and by other agencies. The courses of study, especially in related subjects, may be arranged so that the individuals taking the work may meet at intervals, say once a week, and the work may be so planned that a considerable portion of the course will

require the preparation of work at other times than when the school is in session. The work would of necessity be largely individual and the classes would usually be small in numbers enrolled. The courses would be more advanced than would be the case in evening schools where no work other than that carried on in the classroom or shop is expected. To be efficient such a home-study plan would necessitate the preparation of detailed lesson sheets containing directions for work and giving specific problems for solution.

Correspondence courses in related trade subjects can be organized and evening classes of the kind suggested above might be recruited from the persons in a community actually taking such correspondence courses. The weekly conference would provide much assistance in helping the pupil to persevere in the ambition which has led him to take up the correspondence work.

3. TEACHERS.

The qualifications, selection, certification, pay, and improvement of evening industrial-school teachers must have careful consideration. Unless a teacher well qualified for the work is secured, the class is doomed to failure before its organization. It must be borne in mind that the teachers of evening work will deal with adults, whose attendance is voluntary, and whose practical experience enables them to tell in a short time whether the teacher is "putting across" instruction which is of value.

QUALIFICATION OF TEACHERS.

Experience in the vocation which is to be taught is an essential qualification for all trade or industrial teachers. Absolute mastery of the part of the trade taught in each of the several units is the prime qualification of the teacher of each unit. A course in telephone repair consisting of several units might conceivably require as many teachers as there were units in the complete course. It is impossible to state the trade experience or qualification in years, since the variation from trade to trade in the length of time it takes to master a trade is so great. It may be said, however, that in general, if three years' experience in the actual work of a trade or industrial pursuit is required as a preliminary qualification, one step will have been taken to exclude inadequately prepared teachers. Ways should be left open, however, to secure persons who have had unusual opportunities for preparation and experience in particular parts of a trade offered as evening-school subjects.

Trade knowledge is not, however, the only qualification which the evening-school teacher should possess. It is the *sine qua non* to which the other qualifications must be added. To be success-

ful, the evening-school teacher must be not only a master of his trade, but also in good standing among his fellow craftsmen. He should be a man of good personality and in vigorous health. He should be experienced in handling men and know how to reach them.

SELECTION OF TEACHERS.

It is evident from the foregoing statements that the matter of selection of the right man to conduct a particular evening-school class is of great importance. Unless such a man can be found the class should not be organized. The selection of a teacher forms an important activity of the organization of evening schools, and it is pointed out in the discussion of organization in another place in this bulletin that preparation for the starting of classes has much to do with success after they are organized.

Usually evening-school teachers will be selected from the workers in the industry, and from the residents of the community. Except in the rare cases, where the shop teachers or the related subjects teachers from the day school are prepared to give the instruction, the teacher must be a man who is experienced in the work he is to teach and who retains a connection with the trade. The persons responsible for his selection should make a thorough canvass of the community, prepare a list of eligible persons, make an investigation of their records of experience, the esteem in which they are held by their employers and fellow workmen, and have personal interviews. The "lame ducks" of industry can not make good teachers and the fund for such an important work should never be considered as "easy money."

There should be the closest possible correlation between the teacher-training plan established in a State and the community selecting evening vocational teachers. Many of the States have included in the teacher-training plan the work of recruiting persons from industry for teaching positions. Where such a State list has been established selection from it should be made whenever possible.

CERTIFICATION OF TEACHERS.

State boards of education should allow reasonable latitude to local school authorities in selecting the best persons available for evening-school work. Any scheme for certification should be sufficiently flexible to meet widely varying needs. There can be no satisfactory certification based upon uniform written examinations for all candidates and for all types of schools. Any scheme of formal certification would make it hard to attract desirable persons to the evening-school teaching work.

Since most of the States have laws which require that all teachers in public schools shall hold legal certificates, some plan should be devised which will permit the issuance of certificates to meet the special needs of evening-school work. Such a plan might provide that:

(1) A certificate should be issued which is good only during the time a particular class is to be in session.

(2) A certificate should indicate on its face the particular time for which it is valid, and the particular subject which the holder is to teach.

(3) A certificate should not be renewable, but should be issued *de novo* for each period of employment. Under certain conditions where an instructor shows unusual ability and success, the certificate may be issued for a period of several years, but never for an indefinite period.

(4) A certificate to teach the shopwork or the related work in a unit trade school or class will usually be accepted as evidence of the fitness of the holder for similar work in evening schools.

PAY OF TEACHERS.

A community should pay a wage sufficient to attract to the evening industrial school service those best qualified. In fixing upon a rate it should be kept in mind that the pay can not be for the actual number of hours of instruction alone. In order to do effective evening-school work the teacher must spend a good deal of time in planning for the work of actual instruction. In many cases, indeed, as much time must be given to the preparation of lesson sheets, the distribution of material, the individual records of the pupils, and to other such matters as is given to classroom or shopwork. When teachers are hired for the work they ought to understand that it is not a "two-hours-a-night job," but a job to which must be given all the time necessary to do a good piece of work.

IMPROVEMENT OF TEACHERS.

Every community which employs any considerable number of evening industrial teachers should take steps to help the teachers to do better work while in service. This is really a part of the supervision work, and will be further discussed in connection with the subjects of organization and conduct of schools. Wherever possible, the services of the institution selected by the State board for the training of teachers of trade and industrial subjects should be secured in assisting in the improvement of teachers in service. For a long time to come it is probable that an adequate supply of trained teachers can not be secured for evening-school work, when we take

into consideration the fact that this training must be given to workers from the trades or industrial pursuits usually in evening extension classes and in short terms.

When an attempt is made to improve teachers in service, the same care must be taken to give specific and direct help to the teachers themselves who are being "improved" as is taken to provide for the pupils of the evening industrial schools specific and direct trade knowledge or skill. The man recently recruited from the trade often fails to recognize that there is a body of knowledge known as methods of teaching, class organization, discipline, etc., which he can acquire, and on the other hand, the pedagogue who is teaching teachers fails often to recognize that the psychology, the methods of secondary education, the history of education, and the discipline in day schools bear little relationship, in the terms in which they are usually given, to the job of instructing in evening schools as the instructor from the trades sees it. Usually the teacher-training work can best be given by one who has had evening-school work himself, or who has had much experience in the administration of evening schools.

4. METHODS OF INSTRUCTION.

Certain principles, it must be assumed, will always be followed in an evening industrial school: (1) Good methods of instruction will be based on concrete experiences, since knowledge in any field is most commonly acquired through concrete experiences rather than through abstract thinking. (2) Instruction in an evening industrial school, as in other schools, should proceed from the concrete to the abstract. (3) Methods of instruction in an evening school should provide for training based upon the experiences either in the class or in the daily work of the students. (4) The work should be largely a training process, and correct methods of instruction will regard carefully the order in which experiences should be followed. (5) Correct methods will provide for thinking about things after actual experience with them.

Where the work given is shopwork the processes involved rather than the finished product should dictate the method of instruction. For example, if the individual method of instruction will give each pupil more skill and confidence in using the dividing head of a milling machine than instructing them as a group, the teacher should employ this method even though the group method would turn out more work. Pupils are familiar with the need for production in their day work. Again, if questioning regarding the use of a taper attachment produces a development of the principles involved, while showing or telling merely produces speed in getting along with the work, the former method should be employed.

In related subjects, such as drawing and mathematics, several methods of instruction will be used in the same class—telling, showing, questioning, individual, group, lecture, illustration—and the instructor must predetermine by careful survey of his evening's work what methods he will employ and for what purposes.

All illustrations, prices, drawings, processes, tables, and scientific information should be taken from the actual day trade work of the pupils, and should be absolutely up to date. For example, a carpenters' class being trained in getting out stock bills should be given the best-known and commonly used trade method and the prices quoted in that community at the time the instruction is given.

Charts, diagrams, lantern slides, commercial catalogues, visits to commercial shops and reports on the same, and the use of lesson sheets all have value for instruction purposes. In the use of such devices that method of instruction should always be chosen which places upon the pupil greatest responsibility, necessity for thinking, and need for actual doing on his part.

The question-and-answer is one effective method of relating the instruction to the pupil's interest and experience. Under this method practical questions asked by members of the group and by classes of former years are collected and prepared in the form of lesson sheets, in which the instruction is given by printing or mimeographing the question and immediately after it the answer. These sheets serve as a basis for class discussion, and are retained by the pupils for future reference. By repeating the same question in various forms on different sheets the pupil approaches the subject from various angles and a variety of contacts are established. Allowing the pupil to retain his papers provides him with a fairly complete discussion on each topic in a form he can easily understand. In work involving mathematical calculations the lesson sheet should contain a large number of examples worked out in considerable detail and accompanied by an explanation of each step in the process.

The success of this method depends upon selecting questions that the pupil wishes to have answered; carefully working out the answers with reference to their practical application; clearly stating them in the language of the trade; discussing the questions and answers in the class; and at frequent intervals repeating the questions on other sheets.

Another form of question-and-answer method, useful in teaching technical subjects, is placing in the pupil's hands diagrams and drawings accompanied by practical questions to be answered by an examination of the drawings. This can be varied by substituting models for drawings. Still another variation is to use partially completed diagrams, which, in answer to questions on the lesson sheets, are to be completed by the pupil.

The use of lesson sheets is especially applicable to a group formed under the short unit system, because the material can be drawn from the common experience of the group and represent questions whose answers every pupil wants to know.

Another method of relating the instruction to the pupil's experience and interest is that of preparing lesson sheets, each lesson dealing with one simple unit, as, for example, a lesson in roof framing, dealing with methods of finding the length of a valley rafter. This sort of a lesson sheet should include a variety of diagrams illustrating cases carefully worked out. It should eliminate all related theory and should confine itself to examples, illustrations, statements of facts, and such explanations as may be necessary to make the meaning clear.

A modification of this method is to increase the size of the unit and extend it over a number of lessons. Instead of figuring the length of a valley rafter the pupil may be given a framing plan and required to lay out all the rafters on the plan. Which method should be used in any given instance depends upon the need and experience of the group.

The use of sections of various forms of pipes, valves, or parts of machines, cut away to show construction is effective, not simply because the pupil can be most readily taught through the eye, but because he has a practical interest in examining these things. Equipment of this kind can frequently be obtained from the manufacturer, if he understands the purpose for which it is wanted. Manufacturers will also send their experts to the school to demonstrate their specialties. Where it is impossible to obtain this sort of material from the manufacturer, some of it can easily be constructed within the school itself.

In teaching subjects like mathematics, a valuable method is that of taking typical cases, arbitrarily giving the rules necessary for the required solution, and teaching the pupil how to apply the rules. This work has to be supplemented by a great deal of careful explanation. It is especially effective with the type of pupil in the evening industrial class, because he is interested in the process rather than the reasons that underlie it, and because it gives him at once the information he wants.

In the case of courses which are intended to prepare the pupil to pass an examination, such as is required in some States for an engineer's license, it is well to organize the instruction with the previous examination itself as a unit, rather than some topic of the subject covered by the examination. Experience shows that men with a limited academic background find it difficult to retain instruction long enough to enable them to pass an examination unless there is frequent review of the material on which they are to be examined.

One method of overcoming this difficulty is to take for the unit those phases of the trade that are included in the examination, and prepare lesson sheets that will cover in a spiral all of these phases.

5. BUILDINGS.

The location of the school or class should be as near as possible to the homes of the pupils to be reached. There is not always a choice in this, however, since the building where the work can best be given is determined by other factors, such as the location of the day school, the availability of classrooms properly furnished for adults and properly lighted. It should be kept in mind, however, that the success of the school depends in a considerable measure upon its location. While there are some advantages in having a large number of evening-school pupils under one roof, these do not overbalance lack of adequate equipment or inacceptability to pupils.

In planning for an evening industrial school a careful study should be made of the possible location of classes. It is not absolutely essential that classes should be held in public-school buildings. In fact, the school equipment is often not sufficient in variety and extent to give as satisfactory shopwork as can be conducted in the commercial shop itself. It may be possible, through an agreement between the manufacturer and the school authorities, to secure the use of private plants for public-school work.

In the case of related-subjects work it is entirely possible to conduct classes in halls that are the meeting places of organizations of employees, in libraries, even in private homes, or in churches.

Wherever the class is conducted, however, there must be satisfactory lighting. When pupils come to the school after a long day's work they should not be asked to work for an evening without satisfactory light. As a matter of fact, it takes an unusually strong teacher and an unusually ambitious group of pupils to work against and overcome the handicap of poor lighting.

6. EQUIPMENT.

There are two kinds of equipment to be considered: (1) The shop and related subjects equipment, and (2) the general equipment. The former includes the essential tools by which trade knowledge or skill is acquired, and the second such equipment as seats, blackboards, and books.

An evening industrial school can not do business satisfactorily without proper trade equipment. Too often such schools have been obliged to get along with the equipment of the regular day school, when it is frequently poorly adapted to trade work. It is true that in some subjects effective instruction can be given to the trade worker

without extensive equipment; but no instruction can be given without the proper kind of equipment. When shopwork is to be given in the evening school the equipment should be of the same standard, both as to quality and capacity, as that used in the best plants engaged in commercial work of the kind for which instruction is given. It should be sufficient, both in variety and quantity, to enable the school to give instruction in all the trade processes necessary to meet the needs of workers desirous of improving themselves in their chosen vocation. The usual manual-training equipment is inadequate for evening trade extension.

Not infrequently industrial plants and business houses are better equipped for practical teaching than the schools themselves. Evening classes under public supervision and control held in these plants have the added advantage of the use of machines for illustration and of the use for demonstration of materials and the product itself at various stages of its development.

A certain plant which had provided a drafting room for use of continuation school classes and apprentices permitted the use of the same equipment for evening classes. The teacher either requisitioned such materials and machines from the plant as the occasion made necessary for presentation of the work or took the class into the special shop for the purpose of demonstration.

A studio in the commercial art department of a large printing company furnished a most appropriate and attractive environment for the evening classes in subjects related to the printing process, as well as for classes in lettering, sketching, and all branches of commercial art work.

While a community should not attempt to offer evening industrial work for any trade unless it has an adequate equipment, nevertheless the community should not refuse to undertake such work because at first sight the equipment seems difficult to obtain. A careful study of the equipment available, both in schools and in private establishments, often reveals unexpected sources of supply, and will determine the courses which can be given to advantage.

In related subjects work less equipment is necessary than in shop work. In the beginning of evening industrial work in any community it may be necessary to have related subjects only in the evening school. The Federal board believes it possible for any community, where there is any considerable amount of industrial work, to maintain an evening class in drawing or shop mathematics which will give instruction supplemental to the daily employment of a sufficiently large group of workers to warrant the school authorities in forming a class. The cost of necessary equipment would be almost negligible.

Whenever evening schools are organized the general equipment, such as desks, chairs, and blackboards, should be adequate and suited to the needs of adults. Evening-school classes often have been held in rooms equipped with desks suitable only for third or fourth grade children. In general, equipment for evening schools should be selected on a basis of utility, practicability, and good sense.

7. ORGANIZATION AND CONDUCT OF EVENING SCHOOL WORK.

A community which undertakes the organization of evening classes for industrial workers must realize that it has a very great responsibility in preparing for this service. The work of organization may be compared to the preparation for organization of a manufacturing plant, and the conduct of the school, aside from the work of the classroom teachers, may be compared to the service in a manufacturing concern which is conducted and paid for from funds charged to the overhead account. This section of the bulletin deals with the "overhead activities" of the evening industrial school; i. e., the opening of the school and the supervising of it after it is opened.

RESPONSIBILITY FOR CAREFUL PREPARATION FOR THE WORK.

Unless much careful planning precedes the opening of the school year, it is not likely that the community can render full service to trade workers in its evening schools. This preparation is a perennial proposition, not a seasonal one. The board of education should have under constant consideration such questions as the following:

1. What are the industries in the community for which evening trade extension work can be given?
2. Which of these shall be chosen for evening school work.
3. What conferences of employers and employees can be held in order to determine common needs?
4. What steps can be taken to secure adequate funds for the work?
5. How can teachers with satisfactory qualifications be recruited?
6. Where can classes be held most advantageously?
7. What utilization of private equipment is possible?

These are not questions which can be answered the week before school begins. They need careful and constant consideration. It is to be remembered that evening schools, if they are to be effective, can not be static—they must be dynamic; they can not be fixed—they must be flexible; they can not be constant—they must meet a varying need.

EXECUTIVE HEAD WITH TIME FOR ORGANIZATION.

The board of education should select a responsible head for its evening-school work, and give him time to carry out his plans. Too often the job of conducting evening schools is an added job. An assistant superintendent of schools, busy for an overflowing day and a year, with too few weeks and days for the work of the day schools, is sometimes charged with the responsibility of organizing the evening school. Naturally, where this is done, not enough time and attention can be given to evening-school work, and as a consequence it is opened without careful preparation. The work of evening industrial schools in every city of considerable size is of enough moment to require the full time of a competent director or supervisor. It is really upon the work of this executive that the success of the enterprise depends. It is he who will arrange for the conferences of employers and employees, who will plan the advertising, who will help select the teachers, plan for the location of classes, have charge of the enrollment, have regular evening office hours for consultation with ambitious workers, and provide information for the superintendent of schools and boards of education.

ADVERTISING.

The evening industrial school must adopt aggressive methods of advertising in order to reach persons who can derive advantage from attendance at the school. Something more is required than a statement in the newspapers, or in circulars published by the school department, that certain courses are to be offered. As an illustration of effective advertising, it may be noted that in one city a merchant donated the use of two windows on a prominent corner, which the industrial school used for a most attractive exhibit of products, charts, photographs, and other material illustrating the work of the school. Over 500 inquiries were traceable to this exhibit. The evening industrial school must take the point of view that if it is going to do business it must adopt the methods of publicity employed by successful business concerns. In preparation for the advertising, a list should be compiled of persons, associations, and other agencies that may be interested in the work. There should be included among others the employers of labor in any of the trades or industries for which courses are organized, the officials of labor organizations, officials of welfare associations, and pastors of churches. A list should be kept also of the ambitious workmen who have taken evening work in classes previously established. It is through such organizations and persons that information can be brought to workers who can receive benefits from the school work.

In planning for advertising it is well to consider the following possibilities:

1. *An announcement of the general program* of the board of education for evening industrial-school work.

This general announcement should include a statement of the occupations which it is proposed to teach in the evening schools, the date of beginning the work, the opportunities for registration, and places where instruction will be given. This announcement should be given as great publicity as possible through the medium of the press, the church, and of labor organizations, through distribution in factories, and in all gathering places for men. In order to get still wider publicity it is desirable that announcements be distributed to school children with requests that they be taken home to their parents and older brothers and sisters.

2. *Preparation and circulation of separate statements* concerning each phase of school work which is to be undertaken. If there are to be courses given in gas-engine work for garage men this announcement should be sent to persons most interested in this work, including automobile manufacturers, garage owners, and labor organizations.

3. *Personal letters*.—The director of the work should write a personal letter to a selected list of persons most likely to be interested in the special courses to be given. This letter should state the hours at which conferences may be held with him concerning the details of the work and the time for registration.

4. *Personal interviews*.—The director of evening vocational work should set apart stated hours when he will be available for consultation with prospective pupils, with employers who are planning cooperation, with the school board, and with associations of employees.

5. *Addressing public meetings or meetings of associations*.—Very often this proves the most effective means of advertising. It is unnecessary to state in this connection that such meetings and conferences can not help but bring the director of the work into more intimate contact with the needs.

6. *Posters*.—Announcements of the program of evening-school work should be placed wherever possible.

7. *Advertising in street cars*.—Several evening classes have issued attractive street-car cards, which have developed considerable publicity.

These are a few of the many ways in which the evening schools should be advertised. It should be considered, as has been said before, somewhat in the nature of the publicity work which is undertaken by a private concern having goods to dispose of in the market. Objection may be raised that the cost of advertising amounts to a

considerable sum, and it may be well to state in this place that any effective evening school instruction carries with it a considerable overhead charge in the way of supervision and publicity, if the instruction is to be effective.

REGISTRATION OF PUPILS.

One very important matter in the administration of evening-school work is the registration of pupils. Ordinarily registration takes place the week before school opens, and frequently those charged with the responsibility for registering pupils have had no intimate knowledge of the work which is to be conducted. Consequently applicants are registered without adequate consideration of individual needs and aptitudes.

Such procedure is wasteful in the extreme. There are fundamentals which ought always to be observed in the registration of pupils. There should be present at the registration some one or more persons who understand intimately the work which is to be attempted in each class. It is suggested here that the registration really consists of two parts:

(a) Preliminary registration.

(b) Final registration with assignment to classes.

Preliminary registration should be practically a continuing process. Plans should be begun months before the school is to be opened, and preliminary advertising should be almost constantly carried on. The director of the school should have office hours at convenient places where prospective pupils may come for personal interview and for preliminary registration. Preliminary registration should also be conducted at the plants themselves, and at associations of employees. Through this preliminary registration a list of prospective pupils can be secured, with their addresses and the kind of work which they wish to undertake, and from this preliminary registration conclusions can be drawn as to what kinds of classes will best meet the needs of persons in industry.

Final registration can follow more nearly at the time of beginning classes. Word should be sent out to the preliminary registrants that at certain times and places there will be opportunity for personal interview with final assignment. The second phase of registration may really be called selection from applicants.

SELECTION FROM APPLICANTS.

Time must be given for a judicious selection from the applicants after extended personal interviews, in order that the final grouping of the classes may be determined. This selection from the applicants will be, of course, by occupations. For example, if evening-school

work is to be given for machinists, there will be a special individual interview with each applicant in order to determine the amount of his previous experience and the place in the course where he could best fit, or the particular unit which he should take. It may be determined in particular cases that entrance to the school should not take place until some time later in the year, when the work has been reached which would best fit in with the trade experience possessed by the prospective student.

ASSIGNMENT TO CLASSES.

While there must be a beginning of the school work in the organization of classes, this bulletin indicates that efficient organization demands several beginnings during the year. To take the case of machine-shop work again, it may be possible in the larger communities to run several classes for machinists at the same time, and for each of these classes to have their work arranged in a series of short unit courses. There would be registration in as many groups as there are classes at the beginning of the year, and the possibility of the reassignment of these pupils at the end of any of the short unit courses. There would be the further possibility of entrance to the school, at the completion of the short unit course and before the next unit is begun, of other eligible persons desirous of beginning the work at that time. A full record should be kept of the experience of the persons assigned to particular classes, and this record should be transferred to the instructor who is to have charge of the class. This instructor should, if possible, be present at one or more of the preliminary registration meetings, and he should in turn be called in to help judge the previous experience and fitness of the prospective pupil for the particular work which he is to undertake.

In this interview with the instructor such facts as the pupil's previous trade experience, the purpose for which he wishes the work, his probable fitness to undertake the course, and certain additional data should be recorded in detail. This information should be placed on cards especially prepared for the purpose and filed for future reference.

As has been noted, efficient teaching in an evening industrial school requires that the subject matter of the course should relate specifically to the worker's practical experience and trade interest. It is therefore necessary that pupils so far as possible should be organized into groups, severally composed of persons who have had a common experience and now have a common purpose.

PERSONAL ATTENTION TO INDIVIDUALS.

Evening school instruction for trade-extension work must of necessity be largely an individual matter. Although in a well-organized

school classes will be made up of pupils having a common basis of experience, after all the progress of the persons within this group must be individual rather than group progress. Unless the instructor and the persons responsible for the administration of evening industrial schools keep this constantly in mind the possible effectiveness of evening-school work will never be attained.

RECORDS OF WORK.

A careful record of the work accomplished by each individual must be kept, so that at the completion of each unit of work the record of the individual may be complete and suitable certification of work done be given to the pupil when he leaves the school. When a series of units sufficient in number have been completed, certificates should be granted showing the number of hours in attendance, the subject and number of units, and also the quality of the pupil's work.

THE EVENING INDUSTRIAL SCHOOL A BUSINESS.

In matters of organization the evening industrial school should follow business methods. In many respects the school is a business quite as much as it is a school. It maintains shops which, from the standpoint of equipment, methods of handling work, and the products turned out, resemble closely the commercial shop. It deals with workmen who are regularly employed in industrial plants and it has a variety of trade contacts entirely unknown to the regular school. Under these conditions the school must be organized in accordance with the trades to be taught, and a responsible head should be placed in charge of the instruction for each department representing a trade. The head of each trade department should bear essentially the same relationship to the general director of the whole school as that of the department superintendent to the general superintendent of a manufacturing establishment. This is essentially a business method of organization and has the advantage of fixing responsibility for results to a degree that can not otherwise be attained.

8. RESPONSIBILITIES, OPPORTUNITIES, AND DUTIES OF POSSIBLE COOPERATIVE AGENCIES.

There are agencies interested in and responsible for the success of evening industrial schools, such as boards of education, city superintendents, directors, teachers, associations of employers and of employees, and advisory boards. It is necessary that all these interested agencies should have a common platform upon which is based the work which each specifically undertakes. The responsibilities, opportunities, and duties of several of these agencies are discussed in this section.

BOARDS OF EDUCATION.

Boards of education are finally responsible for the conduct of the school. They are chosen by the citizens of the community to organize and conduct all forms of education; they are responsible to the taxpayers for the efficient use of moneys appropriated for public education; they are the legal bodies which legislate as to forms of educational enterprises which may be undertaken. The conduct of evening-school work is only one of their many responsibilities. It is to be hoped, however, that they may feel that this is not one of their least responsibilities, and that they should not undertake evening-school work unless it is to receive serious and careful consideration.

One of the first considerations is that of financial support. Evening-school work is often thought to be one of the least expensive forms of education, and one which will go on without much attention or thought. The opposite of this is true. If considered on an hour or a per capita basis of instruction it will be found that evening-school work is no less expensive than day-school work. Boards of education should not hesitate to ask for adequate financial support for evening industrial schools. It has been the experience in the communities where these schools have been established for the longest time and where they have been conducted successfully that evening-school funds are the easiest to secure. As a matter of fact, many times it is because of the success of evening-school work that boards of education have been able to get an adequate appropriation for general education purposes. Boards of education should realize that one of their most important responsibilities is in choosing the proper executive to carry out the details of a plan upon which it has exercised its legislative authority, but when once the executive has been selected they should leave most of the details to their agents. It is a fundamental principle in school administration that the school superintendent or the director of vocational work should be unhampered in his efforts to give effective service.

ADVISORY BOARDS.

In order that the evening industrial schools may reflect the industrial interests of employces, advisory boards are often formed, which consist of representatives of labor, and of employers and educators, who prepare in conferences plans for the organization and conduct of industrial work. There are two kinds of advisory boards suggested here: First, a general advisory board which would help the local board of education in its general plans for the promotion of evening-school work; and second, the advisory board for a particular trade or occupation. Certainly no board of education can neglect to secure advice through consultation of the persons most

vitaly interested in this form of education, both employees and employers. Whether this advice is secured through an advisory board or from conferences held from time to time must be decided by the board of education.

Advisory boards have power of recommendation only, although in certain instances certain executive authority may be given. In one of our larger cities an advisory committee was recently appointed to help the board of education prepare for vocational work. A sufficient sum of money was appropriated for this committee, and under its charge a careful study of industrial conditions and opportunities for evening-school trade-extension work was made.

Advisory boards should be made up of persons who have had actual experience in the occupations for which the school prepares. The efficiency of evening trade-extension classes will be measured largely by their ability to meet the demands of the trades and industries for which the school gives supplementary instruction. To meet these demands requires an intimate and practical knowledge of conditions and practices in the trade or occupations. Only those experienced as employers or employees can furnish this information. The task of establishing and maintaining evening industrial schools is so important and so difficult that the instructors in the school, who must themselves have had such experience, need also the advice and assistance of those having practical knowledge of the industry or occupation and of the conditions peculiar to it in the locality.

There should be an advisory board for each trade taught. This board should be made up of at least two appointed persons, one of whom should be an employee and one an employer, and the principal in charge of the school as an ex officio member. These separate committees should be charged with making recommendations concerning the work to be undertaken in the school, should be able to give considerable publicity to the classes, and should enable the local board of education to determine whether or not the work is meeting a real community need.

When several trades are taught in the same school, the different advisory boards may be called together occasionally to consider general policies. For example, a school giving evening work in plumbing, carpentry, machine-shop work, and printing might have four separate advisory boards; each of these would meet from time to time to consider the interests of its particular vocation. Occasionally all the boards should meet together with the principal or head of a department, the superintendent of schools, and members of the board of education to consider the general welfare of the school.

An advisory committee may be of great value to a board of education in the organization and conduct of a vocational school, or it

may be of little or no value, according as the committee is carefully selected and the school board gives it real problems to solve.

ASSOCIATION OF EMPLOYERS AND EMPLOYEES.

If evening industrial school work is to be effective it must be carried on on a platform which can be agreed upon by persons interested. It is therefore advisable for boards of education to hold frequent conferences, at which there should be present representatives from all the large employers of labor and all the associations of employees. There may be even general or mass meetings. Care should be taken to extend invitations to all who are interested, including State officials who have a large responsibility and wide experience in vocational schools, employers from other cities where vocational schools have been established, and representatives of labor.

The program of evening industrial work has nothing to lose from publicity, and until the persons mentioned as being vitally interested in the work can be brought to feel that after all evening-school work is their responsibility, no board of education can be sure of final success.

TEACHERS.

The above statements concerning responsibility are fundamental. Nevertheless, the final success of a particular class rests upon the work of the individual teacher, his social spirit, and the degree to which he assumes the responsibility of anticipating the needs of every individual member of his class.

APPENDIX.

UNIT COURSES FOR EVENING CLASSES.

Suggested fields of trades and industries in which instruction may be given in evening classes to men already employed in these occupations.

<p>I. Automobile repair and construction.</p> <p>II. Baking.</p> <p>III. Building construction (including carpentry, mill-room work, bricklaying, building foremen, cost estimating, and concrete construction).</p> <p>IV. Drawing and design (including building construction drafting, sheet-metal drafting, interior decorating and machine drafting and design).</p> <p>V. Electricity (general).</p>	<p>VI. Gas manufacture.</p> <p>VII. Heat treatment.</p> <p>VIII. Machine-shop subjects.</p> <p>IX. Plumbing.</p> <p>X. Printing (including presswork and linotype operation).</p> <p>XI. Radio operation.</p> <p>XII. Sheet metal.</p> <p>XIII. Slide rule.</p> <p>XIV. Steam fitting.</p> <p>XV. Telegraphy (Morse).</p> <p>XVI. Telephony.</p> <p>XVII. Welding.</p>
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Suggestions as to the way in which the processes in the trades and industries given above may be organized into courses given in a limited number of evenings.

I. AUTOMOBILE REPAIR AND CONSTRUCTION.

The unit courses in automobile repair and construction include:

	Lessons.
A- 1. Practical shopwork and lectures on frames and axles.....	10
A- 2. Practical shopwork and lectures on transmission, clutches, and steering gears.....	10
A- 3. Practical shopwork and lectures on engines and lubrication.....	30
A- 4. Practical shopwork and lectures on carburetors.....	10
A- 5. Practical shopwork and lectures on ignition and magnetos.....	15
A- 6. Practical shopwork and lectures on batteries and starting and lighting	25
A- 7. Laboratory testing and experimenting on ignition.....	10
A- 8. Laboratory testing and experimenting on starting and lighting.....	10
A- 9. Laboratory testing and experimenting on batteries.....	10
A-10. Laboratory testing and experimenting on engines.....	10
A-11. Laboratory testing and experimenting on lubrication.....	5
A-12. Laboratory testing and experimenting on chassis.....	5
A-13. Sketching, plan reading, and mathematics of the automobile.....	20
A-14. Garage organization and management.....	10
A-15. Garage records and cost systems.....	10

	Lessons.
A-16. Salesmanship of automobiles.....	20
A-17. Salesroom records and cost systems.....	10
A-18. Advantages and disadvantages of different types of automobile de- vices and construction.....	10
A-19. Discussion of advantages and disadvantages of motor trucks and their construction.....	10
A-20. Discussion of advantages and disadvantages of different types of gas tractors and their construction.....	10
A-21. Testing strength of material as used in automotive construction....	5

II. BAKING.

The unit courses in baking include the following:

B-1. Elementary baking chemistry (including general chemistry, labora- tory analysis of flour and baking materials).....	50
B-2. Advanced baking chemistry (including lectures on chemistry of bak- ing, laboraory work, fermentations, mircroscopic tests, nutrition tests, starches, sugars, yeast, and yeast foods).....	50
B-3. Bakeshop mechanics, fuels, sanitation, cost estimating and oven con- trol.....	50

III. BUILDING CONSTRUCTION.

The unit courses in building construction may include the following:

BC- 1. Shopwork in house framing.....	10
BC- 2. Shopwork in roof construction.....	10
BC- 3. Shopwork in stair building.....	10
BC- 4. Shopwork in outside trimming and interior finishing.....	10
BC- 5. Mill-room practice	10
BC- 6. Builders' hardware.....	5
BC- 7. Saw filing	5
BC- 8. Mathematics for carpenters and bricklayers.....	20
BC- 9. Elementary sketching and drawing for carpenters and bricklayers...	10
BC-10. Elementary plan reading for carpenters and bricklayers.....	10
BC-11. Taking of quantities and study of building materials.....	10
BC-12. Practical work in laying bonds for bricklayers.....	20
BC-13. Practical work in building arches for bricklayers.....	30
BC-14. Specifications and details in wood.....	30
BC-15. Specifications and details in masonry.....	20
BC-16. Specifications and details in steel.....	20
BC-17. Advanced plan reading and estimating.....	10
BC-18. The building ordinances of Minneapolls.....	10
BC-19. Time keeping and cost distribution.....	10
BC-20. Figuring cost of small structures and city ordinances.....	50
BC-21. Mathematics for cost estimators of large structures.....	50
BC-22. Plan reading and interpretation of specifications for estimators of large structures.....	10
BC-23. Study of materials of construction and city ordinances for esti- mators of large structures.....	10
BC-24. Figuring costs of large structures under \$100,000.....	30
BC-25. Figuring costs of large structures over \$100,000.....	50

The following unit courses may be offered in concrete construction only:

	Lessons.
BC-26. Kinds of cement and their manufacture.....	5
BC-27. Concrete sands and stone.....	10
BC-28. Proportions of concrete ingredients.....	5
BC-29. Mixing of concrete and concrete mixers (including placing of concrete and operation of concrete-mixer engines).....	10
BC-30. Concrete-form construction.....	5
BC-31. Properties and methods of testing cement and concrete.....	15
BC-32. Concrete construction in cold weather.....	5
BC-33. Waterproofing concrete.....	5
BC-34. Cement finishes and surfacing.....	5
BC-35. Cement block, brick, and tile manufacture.....	20
BC-36. Concrete structures (including elementary reinforced concrete)....	15
BC-37. Principles and disposition of reinforced concrete.....	5
BC-38. Reinforcing metals and their physical properties.....	10
BC-39. Mechanics applied to reinforced concrete.....	5
BC-40. Systems of reinforced concrete.....	5
BC-41. Theory of beams and slabs.....	15
BC-42. Theory of columns.....	5
BC-43. Foundations and retaining walls.....	5

IV. DRAWING AND DESIGN.

The unit courses in drafting and design as a special subject may include the following:

D- 1. Elementary building-construction drafting.....	50
D- 2. Advanced building-construction drafting.....	50
D- 3. Elementary sheet-metal drafting.....	50
D- 4. Advanced sheet-metal drafting.....	50
D- 5. Elementary interior decorating.....	50
D- 6. Advanced interior decorating.....	50
D- 7. Elementary drafting for stonecutters.....	50
D- 8. Advanced drafting for stonecutters.....	50
D- 9. Elementary mechanical drafting and machine design.....	50
D-10. Advanced mechanical drafting and machine design.....	50
D-11. Structural steel design No. 1.....	50
D-12. Structural steel design and estimating No. 2.....	50

V. ELECTRICITY.

The unit courses in electricity may include:

E- 1. Elementary mathematics of electricity.....	15
E- 2. Fundamental mechanical and electrical laws.....	20
E- 3. The theory and use of instruments and batteries.....	15
E- 4. National Electrical Code rules and city ordinances on inside work with low voltage.....	15
E- 5. National Electrical Code rules and city ordinances on fittings and materials.....	15
E- 6. National Electrical Code rules and city ordinances on inside work with high voltage.....	10
E- 7. Blue-print reading and estimating of materials for electricians.....	10

	Lessons.
E- 8. Theory of direct-current and alternating-current generators with National Electrical Code rules and city ordinances.....	15
E- 9. Theory of direct-current and alternating-current motors with National Electrical Code rules and city ordinances.....	15
E-10. National Electrical Code and city ordinances on the switchboard and its use.....	10
E-11. National Electrical Code and city ordinances on special subjects (such as fire-alarm systems and motion-picture booths).....	10
E-12. Mathematics, theory, and construction of direct-current generators and auxiliary apparatus.....	10
E-13. Mathematics, theory, and construction of direct-current motors and auxiliary apparatus.....	10
E-14. Use and repair of direct-current instruments in testing.....	10
E-15. Operation and maintenance of direct-current switchboard.....	10
E-16. Elementary course in the alternating current.....	10
E-17. The theory, mathematics, and construction of the alternating-current generator.....	15
E-18. The construction, testing, and repair of alternating-current instruments and motors.....	10
E-19. The construction, testing, and repair of alternating-current transformers and auxiliary apparatus.....	10
E-20. The construction, testing, and repair of alternating-current converting apparatus and switchboards.....	15
E-21. Mathematics and mechanics of outside electrical construction work..	15
E-22. Reading of maps, plans and specifications for outside electrical construction work.....	15
E-23. Methods of handling men, materials, and tools in outside electrical construction work.....	10
E-24. Organization and cost keeping in outside electrical construction work	10
E-25. Treatment, handling and erection of pole line materials.....	10
E-26. Methods of guying wires, poles and wires in outside construction....	10
E-27. Safety devices and precautions for outside electrical construction....	5
E-28. Methods of excavating for conduits and manholes in underground electrical construction work.....	10
E-29. Laying and concreting conduits and manholes in underground electrical construction work.....	10
E-30. Methods of back-filling and repairing in underground electrical construction work.....	5
E-31. Special course in electrical meters.....	50
E-32. Storage batteries for automobile men.....	15

VI. GAS MANUFACTURE.

The unit courses in gas manufacture may include the following:

G-1. Physics and chemistry of gas manufacture.....	10
G-2. Coal carbonization process and coal-gas manufacture.....	15
G-3. Water-gas process and manufacture.....	10
G-4. Steam power plant equipment.	10
G-5. Electric power plant equipment.....	5
G-6. Gas distribution.....	10
G-7. Gas meters.....	10
G-8. Gas appliances.....	10
G-9. Distribution and commercial office practice.....	10

VII. HEAT TREATMENT.

Lessons.

The unit courses in heat treatment include the following:

HT- 1. The physical and chemical properties of metals (including distinction between physical and chemical properties; some simple chemical reactions and formulas; solution—solid solution and eutectic mixtures. Critical temperature of tool steels, including rapid review of the manufacture of cast iron and the common steel processes—Bessemer, basic open hearth, etc., and use of heat curves) -----	10
HT- 2. Simple chemistry in the manufacture of steels and cast iron (including effect of carbon, silicon, manganese, sulphur, and phosphorus on the properties of iron, and the use of shore schleroscope) -----	10
HT- 3. Casehardening, pack hardening, and box annealing. Cyanide process (sprinkling, boiling, and coloring). Bone and composition process (including arrangement of pieces, test wires, and proper methods of quenching). Pack hardening and box annealing (including use of pyrometer, selective hardening, and Jones gas process metal substitute) -----	10
HT- 4. Effect of temperatures on structure of steel and iron (each student will be given samples with directions for heating and cooling. He will make up a complete record of the heat treatment. The pieces will be tested and broken and results noted) -----	10
HT- 5. Tabulated results from HT-4 taken up in class and studied theoretically (including hardening complicated pieces, oil tempering, lead hardening, melted-salt hardening, and various practical devices) -----	10
HT- 6. Review of HT-1, 2, 3, 4, 5. (The first five nights will be devoted to class and shop review of former work, questions, and difficulties straightened out.) Alloy steels (effect of metals on steel mixture)—(chromium, nickel, molybdenum, tungsten, vanadium, manganese) -----	10
HT- 7. Shop and class work on alloy steel (including probable composition determined from properties; proper and improper heating and cooling; schleroscope tests; and calibrating of pyrometer) -----	10
HT- 8. Use of microscope in study of metals (including preparing specimens; hand polishing; wheel polishing; and etching and coloring. Care and use of metallographic instruments (including methods of lighting, vertical; oblique; adjusting objectives and examinations of specimens) -----	10
HT- 9. Simple metallography (including microphotographs of metals; microscopic formation—alpha ferrite; beta ferrite, austenite, martensite, troostite, sorbite, pearlite, and cementite; iron carbon diagram; relation between microstructure and physical properties) -----	10
HT-10. Practical review of entire course (including theory as applied to best hardening room practice; layouts and methods of representative shops; and automatic and recording pyrometers -----	10

VIII. MACHINE-SHOP SUBJECTS.

The unit courses offered in machine shop may include the following:

M- 1. Shopwork on the drill press -----	10
M- 2. Shopwork on the lathe -----	25

	Lessons.
M- 3. Shopwork on the planer.....	10
M- 4. Shopwork on the shaper.....	10
M- 5. Shopwork on the milling machine.....	25
M- 6. Shopwork with jigs and fixtures.....	10
M- 7. Shopwork on tool grinding.....	20
M- 8. Shopwork on grinder.....	10
M-10. Review of arithmetic (including fractions, decimals, percentage, ratio, square root, weights and measures).....	10
M-11. Mensuration (including simple formulas and tables, areas and sur- faces, volumes and weights).....	10
M-12. Speeds and speed ratios.....	10
M-13. Mathematics of lathes.....	10
M-14. Sketching and blue-print reading for machinists.....	10
M-15. Transforming formulas and simple algebra.....	10
M-16. Angles and triangles.....	10
M-17. Milling-machine mathematics.....	10
M-18. Mathematics of gears.....	10
M-19. Mathematics of milling cutters and blue-print reading.....	10
M-20. Modern organization and methods of production.....	10
M-21. Machine-shop materials.....	10
M-22. Mechanics of the machine shop.....	10
M-23. Machine types and attachments and special machines.....	20
M-24. Mathematics and mechanics for machine draftsmen and designers (including trigonometry and graphs).....	50

The unit courses in plumbing include the following:

Pl-1. Roughing-in jobs, including calking and laying out work.....	10
Pl-2. Joint wiping and soldering.....	20
Pl-3. Installing fixtures.....	20
Pl-4. Mathematics and catalogue study.....	20
Pl-5. Drainage and ventilation, plumbing laws and ordinances.....	20
Pl-6. Hot-water supply and circulation.....	10
Pl-7. Chemistry for plumbers.....	20
Pl-8. Drainage and ventilation.....	20
Pl-9. Plumbers' laws and ordinances	10

X. PRINTING.

The unit courses in printing will include the following:

Pr- 1. Printer's English.....	10
Pr- 2. Job composition.....	30
Pr- 3. Imposition	10
Pr- 4. Lettering for printers.....	10
Pr- 5. Free-hand drawing for printers.....	10
Pr- 6. Applied design for printers.....	10
Pr- 7. Materials used in printing (paper, ink, and plates).....	10
Pr- 8. Elements of cost in printing.....	10
Pr- 9. Bookkeeping and cost accounting.....	30
Pr-10. Estimating for printers.....	20

Lessons.

Pr-11. Linotype (mechanism and operation).....	50
Pr-12. Feeding the platen press.....	10
Pr-13. Make-ready on the platen press.....	15
Pr-14. Feeding the cylinder press.....	10
Pr-15. Make-ready on cylinder press.....	20
Pr-16. Mixing colors for pressmen.....	10
Pr-17. Color work for pressmen.....	10
Pr-18. Inks and papers.....	10
Pr-19. Stock cutting and cost estimating.....	15

XI. RADIO OPERATION.

The unit courses in radio operation include the following:

R- 1. Elementary mathematics of electricity.....	15
R- 2. Fundamental mechanical and electrical laws.....	10
R- 3. Elementary course in alternating current.....	10
R- 4. Theory and use of instruments.....	5
R- 5. Construction, operation, and management of storage batteries.....	5
R- 6. Transformers and induction coils.....	5
R- 7. Inductance and capacity.....	10
R- 8. Condensers and oscillating currents.....	5
R- 9. Antennas and grounds.....	5
R-10. Radio power circuits.....	5
R-11. Radio laws and operating practice.....	20
R-12. Wave meters and measurements.....	5

XII. SHEET METAL.

The unit courses in sheet metal include the following:

SM- 1. Elementary shopwork (including rules and regulations for apprentices; machines and their names; elementary soldering and laying out of pipe elbows, pails, and small articles).....	17
SM- 2. Elementary sheet metal work (including listing of material from blue prints; and the use of scale rule in connection with blue prints).....	5
SM- 3. Advanced shopwork (including the making of funnels, octagonal tee joints, scoops, dripping pans, measures, cans, bosses, also wash-boller covers and scale scoops; and advanced soldering).....	10
SM- 4. Furnace work (including the making of different furnace fitting; how to install a furnace—getting the area of the house and selecting a proper place to set furnaces).....	8
SM- 5. Outside jobbing and advanced shopwork (including repairing of outside sheet-metal work, laying of different roofs, and laying out of small utensils).....	10
SM- 6. Architectural and cornice work (including measuring and laying out of a cornice, laying out of gable molds, panels, lintels, and laying out block letters and figures).....	15
SM- 7. Marquee, skylight and window work (including skylight work, such as making of bars, cross bars, curbs, also how to lay out a skylight; laying out and assembling a photographer's skylight; hipped skylights; ventilators for skylights; irregular octagon skylights; monitor skylight; and different parts of marquee and store awnings).....	35

	Lessons.
SM- 8. Exhaust and blow piping (including measuring and laying out of a blow-pipe system, separators, and making of hoods)-----	10
SM- 9. Advanced triangulation (including making and laying out of different fittings, such as boots, angles, etc.)-----	10
SM-10. Automobile sheet-metal work (including brazing, soldering, repairing radiators, fenders, dashboard, etc.)-----	10
SM-11. Test plan reading (including listing of material from blue print in large jobs, amounting to several thousand dollars)-----	10
SM-12. Heating and ventilating in all its branches-----	10

XIII. SLIDE RULE.

The unit courses in slide rule include the following:

SR-1. Elementary slide-rule operation (including multiplication, division, power and roots of whole numbers, fractions, decimals, percentage, mensuration, costs and estimating)-----	10
SR-2. Advanced slide-rule operation (including formulas, such as those used in estimating and designing)-----	10
SR-3. Trigonometry and difficult slide-rule operation (including logarithms, etc., such as used by designers, estimators, civil, mechanical, and electrical engineers)-----	5

XIV. STEAMFITTING.

The unit courses in this subject include the following:

Sf-1. Mathematics and catalogue study-----	20
Sf-2. Freehand sketching and laying out of water, vapor, and low-pressure heating systems-----	20
Sf-3. Plan reading and estimating quantities-----	10

XV. TELEGRAPHY.

One unit course of 50 nights should be offered in Morse telegraphy. This course should cover the Morse code operation and be open to those who desire to become telegraph operators.

The Government has taken so many operators to use in the wireless stations that it has left the country in a crippled condition for telegraph operators at home.

This course as offered should equip the student for a good position.

Classes may be held on Monday and Thursday evenings each week for 50 evenings. A certificate is given at the close of the unit course to each student who satisfactorily completes the course.

Entrance requirements: Any person 17 years of age who shows to the satisfaction of the instructor that he has the ability to become an operator is eligible to this course.

XVI. TELEPHONY.

The list of unit courses may include the following. These unit courses are given the numbers by which they will be hereafter known in all the work of the school:

	Lessons.
T- 1. General science of telephony-----	12
T- 2. Mathematics of telephony-----	12
T- 3. Substation course No. 1-----	12

	Lessons.
T- 4. Substation course No. 2.....	12
T- 5. Private branch exchange No. 1.....	12
T- 6. Private branch exchange No. 2.....	12
T- 7. Cable course No. 1.....	12
T- 8. Cable course No. 2.....	12
T- 9. Exchange aerial construction course No. 1.....	12
T-10. Exchange aerial construction course No. 2.....	12
T-11. Exchange underground construction.....	12
T-12. Toll line construction.....	12
T-13. Central office equipment course No. 1.....	12
T-14. Central office equipment course No. 2.....	12
T-15. Central office equipment course No. 3.....	12
T-16. Central office power plant.....	12
T-17. Testing course.....	12
T-18, 19, 20. Automatic telephony.....	36

XVII. WELDING.

The unit courses in welding include the following:

	Lessons.
W-1. Care of apparatus (including heat and adjustment of flames).....	5
W-2. Properties of metals, fusian conductivity, oxidation and absorption of gas	5
W-3. Gases, oxygen and acetylene.....	10
W-4. Preheating of metals.....	5
W-5. Expansion and contraction of metals.....	5
W-6. Cast-iron welding.....	5
W-7. Steel welding.....	5
W-8. Care and repair of malleables and brazing.....	5
W-9. Aluminum welding.....	5

Selections can be made from the units suggested according to the needs of the particular occupations of the evening-school pupils. This selection will enable a school to prepare a program which will be composed of all the units which can be taken to advantage in the sequence suggested and which will enable the students to secure in a period of years a thorough knowledge of the practical and theoretical phases of a particular occupation.

A few examples of the way in which the units may be offered in a general course follow. The references are to the units described above.

COURSES IN AUTOMOBILE REPAIR AND CONSTRUCTION.

1. GENERAL COURSES FOR AUTOMOBILE MECHANICS.

A. For machinists.

The applicant must be employed as a machinist. He must be able to prove by test that he can do simple machine-shop work on the drill press, grinder, and lathe. To secure a diploma, he must take the following unit courses:

	Lessons.
A- 1. Practical shopwork and lectures on frames and axles.....	10
A- 2. Practical shopwork and lectures on transmission, clutches, and steering gears.....	10
A- 3. Practical shopwork and lectures on engines and lubrication.....	30
A- 4. Practical shopwork and lectures on carburetors.....	10

	Lessons.
A- 5. Practical shopwork and lectures on ignition and magnetos.....	15
A- 6. Practical shopwork and lectures on batteries, and starting and lighting	25
W-1A. Oxy-acetylene welding.....	10
H-1A. Heat treatment and forge work.....	10
A-13. Sketching, plan reading, and mathematics of the automobile.....	20
SM-1A. Sheet-metal work.....	10
A- 7. Laboratory testing and experimenting on ignition.....	10
A- 9. Laboratory testing and experimenting on batteries.....	10
A-10. Laboratory testing and experimenting on engines.....	10
A-11. Laboratory testing and experimenting on lubrication.....	5
A-12. Laboratory testing and experimenting on chassis.....	5

Courses 1, 2, 3, 4, 5, and 6 must be taken in order given. Courses W-1A, H-1A, A-13 and SM-1A can be taken at any time. Courses 7, 8, 9, 10, 11, and 12 can not be taken until all other courses have been completed. It is possible for the student to take two courses per week, thereby doing two years' work in one.

B. For Garage Men.

Applicant must be employed as a mechanic of some kind in the automobile business. It is possible that he can prove up by test on some of these units, in which case he would be given credit. To secure a diploma in this course the student must prove by test that he does not need them or take the following unit courses:

	Lessons.
A- 1. Practical shopwork and lectures on frames and axles.....	10
A- 2. Practical shopwork and lectures on transmission, clutches, and steering gears.....	10
A- 3. Practical shopwork and lectures on engines and lubrication.....	30
A- 4. Practical shopwork and lectures on carburetors.....	10
A- 5. Practical shopwork and lectures on ignition and magnetos.....	15
A- 6. Practical shopwork and lectures on batteries, and starting and lighting	25
A- 7. Laboratory testing and experimenting on ignition.....	10
A- 8. Laboratory testing and experimenting on starting and lighting.....	10
A- 9. Laboratory testing and experimenting on batteries.....	10
A-10. Laboratory testing and experimenting on engines.....	10
A-11. Laboratory testing and experimenting on lubrication.....	5
A-12. Laboratory testing and experimenting on chassis.....	5
M-1 to 8, inclusive. Fifty lessons from these machine-shop courses, work as planned by the school for the individual student.....	50
A-13. Sketching, plan reading, and mathematics of the automobile.....	20
W-1A. Oxy-acetylene welding.....	10
H-1A. Heat treatment and forge work.....	10
SM-1A. Sheet-metal work.....	5
A-21. Testing strength of materials as used in automotive construction.....	5

Units 1, 2, 3, 4, 5, and 6 must be taken in the order named unless the student can show by test that he does not need them.

M-1 to 8, inclusive, can be taken at any time.

W-1A, H-1A, SM-1A, and A-21 must be taken before 7, 8, 9, 10, 11, and 12. It is possible for the student to enroll in more than one class. In this way he may take two years' work in one.

C. For garage managers and automobile salesmen.

This course is open to three groups:

- A. Those completing the general course for automobile mechanics.
- B. The garage managers and foremen.
- C. Salesmen of automobiles, motor trucks, and gas tractors.

Entrance requirements.—The garage manager and foreman must have a common-school education or its equivalent. He must either take the shop course as offered in the general course of automobile mechanic or show by a test that he is familiar with automobile construction.

The salesman must be a common-school graduate and show by test that he has a working knowledge of automobile construction. This general course must be taken in the order named.

	Lessons.
A-14. Garage organization and management-----	10
A-15. Garage records and cost systems-----	10
A-16. Salesmanship of automobiles-----	20
A-17. Salesroom records and cost systems-----	10
A-18. Advantages and disadvantages of different types of automobile de- vices and construction-----	10
A-19. Discussion of advantages and disadvantages of motor-truck con- struction-----	10
A-20. Discussion of advantage of different types of gas tractors-----	10
A-21. Testing strength of materials that are used in automotive construc- tion-----	10
A-12. Laboratory testing and experimenting on chassis-----	10

The following is given as an example of the lessons which may be planned for a particular unit. In this case unit M-2 is chosen. The lessons are taken from Bulletin No. 8, published by the Federal board.

M-2. SHOP WORK ON THE LATHE.

PLAIN TURNING.

Lesson 1.—Oral instruction: Care, cleaning, and oiling of lathe. Proper centering for accurate work.

Lesson 2.—Stock, mild steel, $\frac{1}{2}$ to 1 inch diameter. Finish over all first to accurate length, then to diameter shown on sketch, sample, or blue print. Note the result if the live center is not running true. Grind the centers.

Lesson 3.—Stock, mild steel, $\frac{1}{2}$ to $\frac{3}{4}$ inch diameter. Turn to accurate length and diameter and face shoulder square, e. g., blank bolts.

Lesson 4.—Stock, mild steel, $\frac{3}{4}$ to $1\frac{1}{2}$ inch. Taper turning. Taper by taper attachment.

Lesson 5.—Taper turning by setting over tailstock center. Fit taper plug to a reamed taper hole, e. g., No. 3 drill socket. Give instruction and practice in resetting tailstock center in line for straight turning.

Lesson 6.—Face at an acute angle by use of compound rest. See that the angle is accurate, e. g., gas engine valves. Test with protractor and bevel.

THREADING AND MANDREL WORK.

Lesson 7.—Oral instruction: Threads, kinds and standards; change gears; thread-cutting compounds. Thread cutting, V or United States standard threads. Grind tools to fit thread gauge. Calculation of change gears. Catch

the thread by reversing the lathe. Catch the thread by running the carriage back by hand without stopping the lathe when cutting a multiple of the lead screw. Catch the thread by the index on carriage of some lathes.

Practice cutting threads to fit standard nuts $\frac{1}{2}$ to 1 inch.

Lesson 8.—Thread-cutting V., U. S. S. and A. L. A. M. and pipe threads. Cut pipe threads by backing out tool by hand to get taper. Cut threads feeding tool in compound rest.

Lesson 9.—Practice in miscellaneous thread cutting.

CHUCK AND FACE-PLATE WORK.

Lesson 10.—Oral instruction: Chucks, centering and use of lathe tester. Chuck castings or forgings and face surfaces flat.

Lesson 11.—Boring: Chuck work, centering by cored hole or punched center. Bore to size and uniform diameter. Drill in the solid by use of drill holder. Ream holes to size.

Bore cored holes to size for a short distance to guide the drill which is to follow. Make small bushings.

Lesson 12.—Bore taper holes using taper attachment.

Lesson 13.—Bore taper holes using compound rest (limited to shallow holes), e. g., hole in flange for pipe tap.

Lesson 14.—Face at an angle using compound rest.

Lesson 15.—Face-plate work: Give oral instruction on mounting and inside thread cutting. Fit threads by calipers and plug thread gauges.

Lesson 16.—Turn gas engine valve stems and face valves.

Practice must be given whenever possible in emergency repair work to develop resourcefulness.

ADVANCED WORK.

Lesson 17.—Turn long pieces between centers necessitating use of steady or follow rests.

Lesson 18.—Sliding, driving, running, press, and shrink fits. Turn pieces to micrometer measurements or to gauge and fit accurately.

Lesson 19.—Turning on offset centers. Locate the centers so as to insure that the offset center line is parallel with and the proper distance from the main center line. Rough out and finish a single throw crank shaft. Avoid springing by pressure between centers. Use of counterweight to preserve balance.

Lesson 20.—Rebore gas-engine cylinders, in chuck or in cradle on the carriage, with boring bar. Use care to avoid springing the cylinder in clamping.

Lesson 21.—Turn pistons to fit cylinders: Have piston walls uniform in thickness; ring grooves must be accurate and made to fit standard rings; piston pins at right angles to the axis of the cylinder. Use fixtures to hold pistons.

Lesson 22.—Piston rings. Chuck the tub; bore, turn, and cut off rings, face or grind to proper width, cut, compress in fixture, turn or grind to size, fit to cylinder, allow for expansion at joint. Explain the use of a magnetic chuck. Concentric and eccentric rings.

Lesson 23.—Pulleys. Bore and turn pulleys, keyseat in lathe with tool in tool post and used as a hand shaper.

Oral instruction: Soft metal turning, lubricants, cutting speeds, belt lacing.

Lessons 24 and 25.—Miscellaneous repair jobs for practice. Review of previous lessons. Final tests for course.

PUBLICATIONS OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

Annual Report for 1917.

The Vocational Summary, published monthly by the Federal Board for Vocational Education (Vol. I, No. 1, May, 1918).

Bulletin No. 1. Statement of Policies.

***Bulletin No. 2. Training Conscripted Men for Service as Radio and Buzzer Operators in the United States Army (International Code).**

Bulletin No. 3. Emergency Training in Shipbuilding—Evening and Part-Time Classes for Shipyard Workers.

***Bulletin No. 4. Mechanical and Technical Training for Conscripted Men (Air Division, U. S. Signal Corps).**

Bulletin No. 5. Vocational Rehabilitation of Disabled Soldiers and Sailors.

Bulletin No. 6. Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors.

***Bulletin No. 7. Emergency War Training for Motor-Truck Drivers and Chauffeurs.**

***Bulletin No. 8. Emergency War Training for Machine-Shop Occupations, Blacksmithing, Sheet-Metal Working, and Pipe Fitting.**

***Bulletin No. 9. Emergency War Training for Electricians, Telephone Repairmen, Linemen, and Cable Splicers.**

***Bulletin No. 10. Emergency War Training for Gas-Engine, Motor-Car, and Motor-Cycle Repairmen.**

***Bulletin No. 11. Emergency War Training for Oxy-Acetylene Welders.**

***Bulletin No. 12. Emergency War Training for Airplane Mechanics—Engine Repairmen, Woodworkers, Riggers, and Sheet-Metal Workers.**

Bulletin No. 13. (Agricultural Series, No. 1.) Agricultural Education—Organization and Administration.

Bulletin No. 14. (Agricultural Series, No. 2.) Reference Material for Vocational Agricultural Instruction.

Bulletin No. 15. (Reeducational Series, No. 3.) The Evolution of National Systems of Vocational Reeducation for Disabled Soldiers and Sailors.

***Bulletin No. 16. Emergency War Training for Radio Mechanics and Radio Operators.**

Bulletin No. 17. (Trade and Industrial Series, No. 1.) Trade and Industrial Education—Organization and Administration.

Bulletin No. 18. (Trade and Industrial Series, No. 2.) Evening Industrial Schools.

*** Emergency war training for conscripted and enlisted men.**

**All communications should be addressed to
The Federal Board for Vocational Education, Washington, D. C.**



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BULLETIN No. 19

**TRADE AND INDUSTRIAL
SERIES No. 3**

Part-Time Trade and Industrial Education

**ISSUED BY THE
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WASHINGTON**

OCTOBER, 1918

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1918**

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FOREWORD.

Recognizing that one of the greatest needs in industrial and trade education is the immediate establishment of part-time schools and classes which will extend the education of wage earners, the Federal board has given the matter attention from the day of its organization. This bulletin is one of a series prepared for use by State authorities and by employers and employees, as well as educators, in the promotion and development of systematic instruction for workers. Included in the series are Bulletin 17, on "Organization and Administration" of the various types of trade and industrial schools, and Bulletin 18, on "Evening Industrial Schools."

It is doubtful, from the standpoint of securing the rapid and effective training of the industrial workers of this country, whether any other problem is so important as that of extending the scope of our public-school education to provide for the needs of workers who have left school inadequately prepared for any industrial pursuit, or even for assuming the duties of citizenship.

Even among those who may have regarded with some misgivings the rapid development of vocational instruction in the schools there can be no opponents of part-time instruction for workers who have finally left the schools, and for whom the alternative to part-time education is no education whatever, or such only as can be given in evening classes to pupils whose energies have been largely exhausted by employment during working hours. In the arrangement of part-time instruction no question can arise as to the wisdom of substituting vocational for other sorts of education, since no sort of education is being given. It is a question only of devoting some portion of the regular working time to systematic instruction devised with reference to the specific needs of the workers themselves. Local school authorities in conference with representatives of employers and of labor may in their discretion give to part-time courses a wide range to embrace any instruction formulated to increase civic or vocational intelligence. In any given case, therefore, the course set up may be a general elementary school course, or it may be specifically vocational and practical in any degree determined upon as most suitable to provide for the needs of workers. In some States, as is pointed out in the present bulletin, provision of part-time courses and attendance upon such courses within certain age limits, has been

made compulsory, and enactments making such instruction compulsory will undoubtedly be passed in other States in the development of their educational policy.

This bulletin was prepared by Mr. H. B. Smith, regional agent for trade and industrial education of the Federal board for the eastern region. Acknowledgment is made to Mr. R. J. Leonard, regional agent for trade and industrial education for the east central region; to Mr. L. H. Carris, assistant director for trade and industrial education; and to others, for criticism and suggestions.

C. A. PROSSER, *Director.*

PART-TIME TRADE AND INDUSTRIAL EDUCATION.

I. THE NEED FOR PART-TIME SCHOOLS IN THE UNITED STATES.

Every year an army of untrained children is going out of the public schools. A large number go to work because the wage they can earn is regarded as necessary to the proper support of the family. Many of these children, however, leave not because that wage is absolutely indispensable to the maintenance of the family, nor because they and their parents are indifferent to the value of all education, but because they and their families, feeling the economic pressure, do not believe that the ordinary schooling prepares young people for their life work in a way that justifies the struggle necessary to keep them in school any longer. A small number of these young people have definite ideas as to what calling they wish to follow, and these, together with a few who have no definite aim, enter upon instruction in trade and industrial schools, apprenticeship or trade helper systems, correspondence courses, elementary technical schools or similar agencies for vocational training.

The majority, however, march directly from the school to the factory, from the classroom to the workshop, where there are no facilities for continuing their general education. They are untrained industrially at the start, and, therefore, can not profit, except in small degree, from the instruction given by journeymen, pieceworkers, and shop foremen.

Some form of public instruction must be set up to meet the needs of this untrained juvenile army. Evidently this instruction will achieve the desired end only in so far as it provides for such vocational training as will permit the continuance of wage-earning on the part of the pupils. One or both of two generally recognized types of schools or classes, evening and part-time, the former coming after the day's work, and the latter during a portion of the regular working day, will furnish the kind of education needed. For many reasons to be mentioned later, part-time are preferable to evening classes for youthful workers, and it is with part-time instruction that this bulletin is particularly concerned.

The need for these schools is specially urgent to-day and their establishment as an integral part of the school systems of the States

is imperatively necessary not only in order to provide for the normal demands of youths seeking training for gainful occupations, but also as an aid to the war preparations of industries handicapped by a shortage of labor and inability to recruit and train beginners for work on war necessities.

Moreover, the time seems opportune for the inauguration of a National program for part-time education, making of it, under the emergency of war, a national issue.

The time has passed when the thinking public in the United States has to be told that there is a real need for industrial education. When it comes to determining just what form of industrial training shall be given to supply the recognized need, opinions naturally differ.

Three general types of school have been developed as a result of long-continued discussions and considerations of the different needs to be provided for, namely, the all-day, the evening, and the part-time school. (See examples in Appendix C, p. 51.)

The first two are named from the time of the day in which they are in session. The third, or part-time, is any school conducted for a limited number of hours during the regular working day. Such a school is open to minors and adults who have entered upon employment, and its several aims are to continue neglected or interrupted elementary education and to prepare for entrance into better occupations or to supplement and extend knowledge and skill in present occupations.

The name "part-time school" is given to any school to which the definition just given applies. When the school aims to complete general education, it is designated a part-time continuation school; when it aims to increase skill and intelligence in a vocation other than that in which the pupils are employed, it is a part-time trade preparatory school; and when it provides training that is strictly supplementary and related to the employment of its pupils, it is a part-time trade extension school.

Each of these three types is considered in succeeding divisions of this bulletin, but the part-time school idea in its large sense rather than any of its particular phases is the matter of chief interest.

The bulletin is concerned primarily with what the State should do for the vocational betterment of boys and girls released from school at ages ranging from 12 to 16 years, with or without legal permits to go to work. Ordinarily the State has considered its educational duty done at this point. It has neither continued general education, provided vocational education, nor sought to bridge over the gap between school and industrial plant. Within recent years, however, some States have come to feel that their educational

responsibilities toward their children were not terminated by the issue of a work permit and that no matter whether at work or in school, the minor was the educational ward of the State until he was properly fitted for life or reached an age of discretion. This awakened educational consciousness on the part of the State is a hopeful sign, especially as it has been fostered by labor itself, which has more than once assumed the attitude "that the children leaving school may not be deprived of all their opportunities to improve their education and secure more knowledge. The longer we can keep the children of the Nation in contact with our public schools and our public school-teachers, the safer our civilization will be."

Employer, employee, and educator alike have come to realize that the many pupils who leave the public schools at an early age never learn the relationship between the theory taught in school and the practices of the shop. "A few hours' school instruction each week in related technical work, personal hygiene, shop and home sanitation, civics (in relation to daily problems), builds a tangible superstructure upon previous schooling which becomes a bond between the school and shop and State."¹

Between the ages of 14 and 18 a boy is just beginning to find himself as a unit in society and business, and he is then in need of continued training which is both practical and interesting and which will awaken in him a desire for civic intelligence and vocational efficiency. How poorly we have measured up to the possibilities of doing this may be seen from the following statistics. (See also Appendix A, Table 3, p. 45.)

	1910. ²	1918. ³
Children 14 and 15 years of age-----	3, 569, 347	3, 950, 000
Number not attending school-----	892, 882	990, 000
Children 16, 17, and 18 years of age-----	5, 579, 317	6, 300, 000
Number not in school-----	3, 571, 076	4, 030, 000

Approximately 2,000,000 children arrive annually at any given age between 14 and 18. In these years the proportion not in school increases rapidly from less than one-fifth for the age 14 to nearly four-fifths for the age 18. In the succeeding two years of minority the proportion rises to more than nine-tenths. We may safely conclude that about 5,000,000 children 14 to 18 years inclusive are out of school, and that practically all of the boys and a large proportion of the girls not at school in these ages are at work. A very large proportion of these young workers have left the public school without

¹ R. J. Leonard, Regional agent for industrial education.

² United States Census.

³ Estimated; it is assumed that the annual increase of population since 1910 in this age has been approximately equal to the average annual increase in the decade 1900-1910, and that the proportion not in school was the same in 1918 as shown for 1910 in the census returns of school attendance.

completing an elementary education, or preparing themselves for any specific vocation. Children of this type are leaving the public schools to-day at the rate of a million a year, and the facilities offered up to this time for giving them any vocational training or preparation for earning a living, have been so inadequate that it is hardly worth while to enumerate them. Figures published by the United States Bureau of Education¹ for the year 1913-14 show that in all public manual training high schools, agricultural schools, and manual and industrial training schools combined, there were only 166,250 pupils taking "manual arts" instruction. Of these 52,285 were in elementary grammar grade courses and the remaining 113,965 in secondary or high school grade courses. In connection with these figures the bureau estimates that approximately 60 to 75 per cent of the blanks sent to school were returned properly filled out. Accepting therefore this total as representing 50 per cent of the pupils in this country who are being cared for in these three types of schools, many of which have only the most hazy idea of what real vocational preparation should be, it is fair to conclude that in the year 1913-14 only about 300,000 children were receiving instruction in such schools. Noting, further, that these students are partly in 2-year and mainly in 4-year courses, it may be assumed that the number graduated each year does not exceed one-third, or 100,000, and probably does not exceed 60,000 to 75,000. It can not be assumed that even this small number among the million leaving school each year have received any systematic instruction specifically designed to assist them in earning a living.

For a large majority of these pupils, and for practically all of the others who make up the million leaving school each year, a part-time plan of education is needed. There is a very well-defined sentiment in America that the all-day school is based almost entirely upon a definitely outlined plan of work for groups rather than for individuals, and that the part-time and the evening schools are more likely to be considerate of human needs and to make such changes and adjustments as are necessary to supply immediate instruction to those young persons who are at work, or who contemplate entrance into wage-earning employment.

There is a decided feeling at the present time that the United States is failing to offer adequate preparation for those who serve the country in industry and that the common day school, in spite of all its great advantages and unified courses of study, does not offer the type of instruction that will seek out the boy with the need and then apply itself directly to supplying this need. Moreover, the evening school, while a popular and exceedingly desirable form

¹ Bulletin 1915, No. 19, "Statistics of certain manual training, agricultural, and industrial schools," Table 12, p. 42.

of industrial education, is often, because of its night work, too severe a physical tax upon the vitality of a growing child.

The report of the Superintendent of Schools of New York City, in dealing with evening classes during the year ending July 31, 1915, makes this pertinent comment on compulsory attendance in evening schools:

The most baffling problem attacked by our evening schools is the enforcement of the law requiring the attendance of boys between the ages of 14 and 16. In the year ending March 31, 1915, there were issued 33,903 labor certificates. Assuming that the ratio of boys to girls was four to three, we should have had an attendance of at least 19,873 boys. The actual number that did attend on instruction was 4,093, while the average attendance was only 2,032, about 4.6 per cent of the total average attendance in evening elementary schools.

During 1911-12, Dr. Shiels, Director of the Research Bureau of the City of New York, made a careful investigation of the evening school attendance problem. Again in 1912-13 he devoted five pages of his report to a similar discussion and noted that "no advance in success seemed to have been made." This later report declares that the greatest opportunity for progress in this line of work will be found in the "legislation regarding part-time and continuation schools and courses of study, noting that the board of education may at any time compel day attendance of work boys and girls under 16 between the hours of 8 a. m. and 5 p. m., and that the employer who will not allow such attendance must surrender the privilege of employing such labor." The consensus of opinion of the investigations made up to July 31, 1915, is summed up in the following paragraphs from the report of the city superintendent of schools:

The two years since passed have brought fruit in the growth of the knowledge of the value of this (part-time) law. Under the immediate direction of Associate City Superintendent John H. Haaren, the number of these classes has grown to 46 with 932 pupils in attendance. I have no doubt whatever that in the establishment of such classes, and in the enforcement by the board of education to its fullest extent of this new law will be found the solution of the problem.

We might as well accept the situation, that with no possibility of a proper force of attendance officers assigned for the particular purpose of enforcing the evening school law, with public sentiment of employers, magistrates, and even school men themselves generally opposed to forcing boys exhausted by a long day's toil into our classrooms, that our present methods are hopeless, and so we come back to the first statement that the solution of the problem of the compulsory education law pupil is only to be found in the strict enforcement of the new law for continuation day instruction.

Moreover, the evening school has not the same hold upon interest and attention as a part-time school, because the daylight classes of the latter are held during the working hours of the pupil and arouse, in consequence, a feeling of responsibility on the part of the employer

and the youthful employee to make the most of the time thus set aside for education.

It is to be noted, in conclusion, that the part-time school has the support of the young people for whom it is intended. The result of a survey made in Massachusetts shows that 70 per cent of the pupils who are at work and who would ordinarily be included in the classes of a part-time school, are in favor of that type of education as compared with other forms of vocational training.

As regards the need for part-time training the following quotation from an article by Mr. Fred H. Colvin is of interest. The article printed in the *American Machinist* of June 20, 1918, is entitled "Training men instead of stealing them."

The time has gone by when this very important subject can be longer neglected, and the stealing of men from other factories is likely to be the subject of drastic action in the very near future. It has become absolutely necessary to train men and women—to increase the supply rather than to waste time in devising ways and means of luring them away from some one else. And the time is probably not far distant when training will be made compulsory as it now is in Great Britain. There it has now reached the point where every firm (with a very few exceptions) employing 300 or more workers must organize a portion of the shop as a training school for improving the skill of unskilled workers. Smaller factories are exempted, but arrangements are made with neighborhood technical schools for carrying on the work. This training must be done whether the shop has a sufficient number of trained men or not, so as to maintain the supply of skilled labor in the kingdom. This arrangement includes the paying of the worker during training on the same basis as that earned before the training period. France has also made training compulsory in all shops, which emphasizes the need for us to follow suit so as to have a supply of workers.

At present numerous cities are taking an active interest in this matter and so are a number of companies. The Curtiss Airplane Co., Buffalo, is devoting 30,000 square feet to this work and, it is reported, it is turning out about 150 workers a week. The Wright-Martin Co., New Brunswick, N. J., the Bethlehem Steel Co., with its 40,000 employees, and others are lined up for this work.

The Lincoln Motor Co., Detroit, is training women in a special school so as to make them familiar with the work when they go into the shop. It has secured a high class of workers, giving preference to those between 28 and 35 years old and who have relatives at the front. They are taking hold in splendid shape. Many other instances might be cited, but these will suffice not only to show the need of this work but the fact that it can be done with a little persistent effort. And its effect will be evident long after the war is over. It is time to begin the work now in every section of the country where manufacturing is carried on.

II. THE SCHOOL MAN AND THE EMPLOYER AS FACTORS IN PROMOTING PART-TIME EDUCATION.

As a people, we have been committed for over 50 years, to the realization of a national program for agricultural education. Millions of dollars have been spent by the Federal Government and the various States for experimenta-

tion, research, laboratories, libraries, instruction of college grade, and, during the last two decades, for agricultural high schools and departments. Education for home economics has, likewise, been part of our program for many years, so that now practically all universities, most high school, and many elementary schools have departments for teaching the home arts.

In industry, however, the situation is entirely different. Since the establishment of the Massachusetts Colony, we have always recognized the existence of the problem of industrial education as first evidenced by early apprenticeship and poor laws, and later by constitutional provisions.

The General Court order of 1642 laid stress upon all parents and masters the obligation "to give them training in employments which would be profitable to themselves and to the commonwealth."

The second step in the evolution of the right of the State to control youthful workers is found in the constitutional law of many of the States, providing that masters shall teach youthful workers the art and mastery of their craft, and also reading, writing, and arithmetic including the rule of three. Such provisions are to be found in at least 10 State constitutions now in effect, although it is readily admitted that as a practical measure the laws are inoperative.¹

These earlier laws placed the responsibility for both vocational and elementary education upon the master workman, thus carrying the school work into the shop; whereas the tendency in all modern legislation is to place the responsibility for vocational training upon the educational authorities, thus carrying the shop work into the school. This can be done successfully only by a part-time school which has the heartiest cooperation from public-school men willing to face the issue with constructive and open-minded thinking. In the first place they must cease to think only of children in school and begin to think clearly of children at work. They must be neither indifferent to the man at work nor willing to assume that industry itself is perfectly able to care for the man and probably able to provide for the child. Already able to look upon the boy or girl as a potential citizen rather than as a potential scholar, they must go one step farther and think of them both as potential workers. The moment a schoolman becomes interested in a student as a prospective worker his cooperation in the vocational training of that student is assured. Again, the introduction of part-time education into a municipality will at once involve its schoolmen in "life" problems and in forms of educational administration of which they have been both ignorant and fearful. The part-time school apparently overthrows the time-honored ideal of the school as a basis for citizenship only. The general educational authorities must, however, recognize that the true value of citizenship is related directly to earning power and that consciousness of a capacity to earn a satisfactory wage is the best possible basis upon which to build a dependable citizenship for a self-reliant democracy.

¹ R. J. Leonard, agent for industrial education.

So far as administration is concerned, there will arise new problems involving cooperation between the school and shop, joint records, rearrangement of program, placement agreements, follow-up work, and the like. But the educator trained to administrative work will find these additions in no way comparable in difficulty or quantity to those added in the last 25 years, through the ever-widening field of the regular public school.

The employer, also, must remove his opposition to the introduction of this system of vocational training. There is no longer any excuse for considering it an innovation of uncertain effect upon production in the factory. It will necessitate changes and increase administrative burdens, bringing such unaccustomed procedure as the rotation of men in a series of jobs, the shifting of men from shop to shop, the possible idleness of some machines for short periods, and various conditions more or less abhorrent to the methodical manufacturer and business man. In return for this, however, the part-time system will provide him with more ambitious and better operatives, employees preparing and prepared for advancement, capable foremen, and perhaps even assistant superintendents. Of equal importance, although not so well recognized, it will increase the interest of employees in the work of the plant, with consequent increased length of service and contentment on the job. This naturally reduces the dreaded "turnover," and for this reason, if for no other, should appeal to foresighted employers. Those who have tried this part-time scheme for their apprentices commonly testify that in plants where four to eight hours a week are devoted to schooling, there has been no decrease in production due to this loss of time. Even where the opposition of employers has not been great enough to be recognized as such, there has been no real feeling on their part of the need for this type of vocational training, and consequently there has been but little disposition to encourage it and work for it.

All things considered, now is the psychological time for the introduction of part-time education. The present world crisis is bringing us to the conscious realization that as a people we are insufficiently trained. The employer in every phase of industry and in every part of the country is now in need of men, especially men with more skill and self-reliance than the average. This need makes him particularly well disposed to listen to any proposition which will make it possible for him to secure more and better service. His cooperation is assured if he can convince himself that the part-time scheme is right.

From the side of the employee there has come little or no opposition. As has already been shown, young people themselves are favorable to a combination of school and work, and the trades unions, even when they have not been enthusiastic, have not been opposed to industrial education so long as it is publicly supported and con-

trolled. They have emphatically, and usually enthusiastically, favored the part-time scheme over all other types, with the proviso on all occasions that instruction in both school and shop shall be thorough and practical.

III. DUTY TO PLACE THIS QUESTION BEFORE THE COUNTRY.

In the light of the foregoing statements, and of the experience of foreign countries—which will be considered in Section V—and because of the critical labor conditions now being faced, it is undoubtedly the duty of the Federal Board for Vocational Education to place this matter of part-time instruction squarely before the people of the country. This is done now in order to help all parties in the State who are interested in the preparation of suitable legislation, to emphasize the importance of placing this kind of education under representative public control, to place before State boards of education the importance of such work as a means of social, of industrial, and, through these, of civic betterment, to offer immediate opportunity to those beyond the reach of the day school, and to prevent the industrial movement from tying itself up exclusively to the all-day vocational school idea.

The average citizen employer and wageworker in the United States has accepted without question the general proposition that he has nothing to contribute to educational work. Together with the professional schoolman, he has looked upon schooling as something set apart from real life. The fact is that the ordinary citizen has much to offer in the way of helpful suggestion and specific information for use in educational institutions, if he will only realize it and begin an intelligent study of the possibilities in this direction. Nowhere so much as in industrial education is this true, and in no form of industrial education is it more true than in evening and part-time classes. It is important, therefore, that this phase of the question, with all its latent possibilities be placed before the people at this time.

The fact that not more than seven States of the Union have up to the present time taken action by law¹ resulting in the establishment of a State system of vocational schools for the continued preparation of young people already occupied in ordinary labor, is further evidence that our people are not yet fully alive to the fact that evening and part-time schools are just now vastly more important and profitable than all-day trade schools. This is especially sig-

¹ It should perhaps be noted in this connection, however, that all of the States have accepted the Smith-Hughes law, which provides Federal money available for the support of part-time education under joint Federal and State supervision, and that the Federal law itself, in its special provision, is an expression of national interest in part-time education.

nificant when it is remembered that every State in the Union except Mississippi has some form of general compulsory education law. There is, however, a growing feeling of need for the former type of instruction. This is evidenced by the fact that Ohio plans to devote much more time to the development of continuation schools and to the training of teachers for them; that North Carolina is planning to expend all her Federal money for industrial and trade education on part-time and evening classes; and that practically all the State plans approved by the Federal Board for Vocational Education have given careful attention to the part-time continuation school as one of the principal issues in their new State organization for vocational training.

Before discussing further the plans and future possibilities of this work, it will be well to note here what has already been done along these lines, both in the United States and in foreign countries with somewhat similar problems.

IV. PART-TIME SYSTEMS ALREADY ESTABLISHED IN THE UNITED STATES.

Despite the difficulties and deficiencies already mentioned, part-time education has found a more or less firm footing in the educational system of several of the leading States in this country, notably in Wisconsin, Pennsylvania, Massachusetts, New York, Indiana, and Ohio. Possibly by the time this report appears New Jersey will have been added to the list.

WISCONSIN.

In 1911 Wisconsin passed a law making it compulsory for all employed children between the ages of 14 and 16 to attend a part-time school one-half day a week. The 1916 report shows that this law has been modified so that all children between 7 and 14 years of age and between 14 and 16, when not employed, must attend the all-day school; but that children between 14 and 16 who are regularly employed and who are living within 2 miles of a town school, or within the corporate limits of any city or village, and who are physically fit for such work, must attend the part-time school, if one is provided. The law further specifies that when 25 persons qualified to attend such instruction shall file a petition for such a school, the local board must establish the same, the courses to be approved by the State superintendent of education and by the State board of industrial education, and to be, like the other forms of industrial education, State aided. The Bray Act of 1917, while not modifying any of the above statements, has changed the hours of attendance and

increased the age limit to 17 years, so that at present pupils between 14 and 16, and after September 1, 1918, pupils between 14 and 17, must either attend an all-day school or else be regularly employed and in attendance upon a continuation school for eight hours per week for eight months of the year. It is provided also that permit pupils between the ages of 16 and 17 in part-time schools shall devote one-half of their time to practical work and one-half to related subjects and citizenship training; and it is further provided that only indentured apprentices and work-permit pupils between the ages of 14 and 18 years may be excused for any permanent employment.

PENNSYLVANIA.

The State of Pennsylvania in 1915 passed the Cox Child Labor Act, which established continuation schools to extend general education and to give vocational and civic intelligence. These schools are for pupils between 14 and 16 years of age having work permits, with the exception of those in farm and domestic service. The law provides that these schools shall be established by school districts if more than 20 minors eligible to such schools are living in the district. The school session is the same number of weeks as that of the common school, and pupils may attend eight hours for one day per week or four hours each two days per week, or two hours each four days per week, or they may attend continuously, the total number of hours being eight times the number of weeks the common school is in session. These schools must be approved by the State superintendent of public instruction and be part of the free public-school system. Furthermore, an employer may establish such a school in his plant for his own men, and attendance at such a school will be accepted by the law. The public schools are State aided, receiving yearly \$150 or \$200 per teacher and 50 per cent of the cost of equipment, not to exceed \$3,000 in any one school. Because of the high percentage of illiteracy of pupils between 14 and 16 Pennsylvania devoted itself at first very largely to general continuation school education, and has worked in the direction of vocational intelligence as the schools became more firmly established.

The general continuation school developed under this act has a typical course which divides the time as follows: Forty per cent to academic subjects, 30 per cent to fixed vocational subjects common to many industries, and 30 per cent to variable vocational subjects. Abnormal labor conditions make figures useless, but the report of 1916 gave 100 school districts with 36,000 pupils in attendance upon part-time continuation schools.

MASSACHUSETTS.

The State of Massachusetts, by legislation enacted in 1911 and amended in 1913, provides that the school committee in any city or town may establish continuation schools for pupils between the ages of 14 and 16 who are employed at least six hours a day, and they may establish these schools in the city or town where the children are living or in the city or town in which the children are employed. It is to be noted in this connection that the board may, not must, establish such schools, thus leaving the initiative with the board. Moreover, Massachusetts provides that the local board may, with the consent of the State board, compel attendance upon these schools of all children between the ages of 14 and 16 receiving certificates after the establishment of the school, provided they are not otherwise receiving equivalent instruction. Here again Massachusetts avoids State compulsion. The schools are to be in session not less than four hours per week, between 8 o'clock in the morning and 6 o'clock in the afternoon; they are to be reckoned as part of the lawful working day, and the State pays half the net maintenance cost. Up to the present time Boston is the only city which has adopted compulsory continuation school attendance.

NEW YORK.

The State of New York, by legislation enacted in 1910 and amended in 1913, compels all children between 7 and 14, or in towns of less than 5,000 population, between 8 to 14 to attend a full-time school for 160 days a year as a minimum. Children between 14 and 16 must do the same unless regularly employed with a work certificate. In such cases, in cities of the first and second class, these children must attend evening school for 6 hours a week for 16 weeks if they have not completed the full elementary public school course. The law provides, further, that pupils between 14 and 16 when employed on certificate in any city or district where part-time and continuation schools have been established, and who are not graduates of the elementary school or its equivalent, may be compelled by the board of education to attend continuation school instruction for 36 weeks in the year, not less than 4, nor more than 8 hours a week, and between the hours of 8 a. m. and 5 p. m. This condition frees the pupils from the evening school requirement, and they are to present a certificate of attendance issued monthly. It is to be noted that the law leaves it with the board of education to determine whether such schools shall be established or not, and whether or not the attendance shall be compulsory.

INDIANA.

The Indiana State law of 1916 provides that part-time classes for industrial, agricultural, and domestic science subjects may be established. The instruction must be complementary to day employment. Attendance is limited to persons over 14 and under 25 years of age. When part-time classes are established, boards shall require attendance of youth between 14 and 16 years of age. Attendance must not be less than five hours per week between 8 a. m. and 5 p. m. So far as it has been possible to ascertain, a few classes are in operation under this law, including one for girls in South Bend.

OHIO.

The State of Ohio by legislation enacted in 1913 provides that boards of education may establish part-time schools to be attended by youths over 15 and under 16 years of age who are regularly employed. When such part-time schools have been established, attendance is mandatory. The instruction shall not exceed eight hours per week, and shall be given between 8 a. m. and 5 p. m. The acts relative to child labor, restrictive employment, and hours of labor, are supplementary to this law in that State.

COMPULSION UNDER STATE LAWS.

It is interesting to note the varying degrees of compulsion which the several States included in their laws, as well as the different methods used to locate responsibility for the establishment of these schools.

In Wisconsin the initiative is left with not less than 25 persons qualified to attend, and their petition becomes compulsory upon the local board and carries with it compulsory attendance of pupils. New York and Massachusetts, however, have left the initiative with the local board and have also given it permission to require or not to require compulsory attendance.

Indiana and Ohio have followed Massachusetts and New York in making part-time schooling permissible, but not compulsory upon the local boards, and, like Wisconsin, have compelled attendance of pupils within the designated age limits. Ohio emphasizes the responsibility of the pupil to attend, and Indiana lays compulsion upon the boards to require such attendance. Pennsylvania alone has real compulsion, the school and attendance being arbitrarily required in a district where 20 qualified persons reside.

V. CONTINUATION SCHOOLS IN FOREIGN COUNTRIES.

Unlike the United States, foreign Governments have been emphasizing part-time systems of education, in some instances for 30 years.

GERMANY.

It is generally understood that, owing to the exigencies of the war, the Germans have laid great stress on technical and scientific education not only in their technikums or polytechnic institutes but also in their industrial and trade schools of secondary and elementary grade.

With no specific authority either for or against the conclusion, it is probable that much of this elementary work is being done on a part-time basis, especially wherever it has encroached upon the regular trade and industrial instruction. Previous to the war the continuation school was the basis of industrial education in the German Empire, the all-day school being practically reserved for the self-elected and the state-selected advanced industrial pupil. The idea in Germany has been to develop a continuation school to meet the local industrial needs and not to produce a uniform national system, in so far as courses of study and methods of instruction are concerned, while the administrative work has been very highly centralized in the ministry of commerce and industry. Holland, Austria, Italy, and Scandinavia are more and more following Germany's lead.

There were several distinct types of industrial schools in the German Empire which, there is every reason to believe, have not been greatly modified and which may be described as follows: The Sunday school, which runs four hours on Sunday, is given on the pupil's time (that is, he receives no pay for attendance at such a school), and is devoted about equally to advancing and continuing the general education on the one hand and to improving vocational efficiency on the other. Next comes the general continuation school, which is least common among the part-time schools of the Empire. Its function is to continue general education, whereas most of the German States require the completion of the elementary school course before a pupil is permitted to enter employment, and, consequently, to begin attendance upon part-time instruction. The trade preparatory continuation school, which proposes to train for an employment in which the pupil is not at that time engaged, is entirely unknown in the North German States and appears only in a few of the largest cities of South Germany. The fourth type, the trade extension continuation school or class, makes up almost the whole of the vast system of part-time education which Germany has established.

These trade extension schools are of several different kinds according to the hours of attendance, the time of attendance, and the method of compulsion.

Some of these schools are run on the basis of four to eight hours weekly entirely on the employer's time, he being compelled to pay wages to all children under 18 in attendance upon such instruction. A considerable number of schools running from four to eight hours a week divide the time so that the employer pays for part of it and the student contributes from his spare time or Sunday, the remaining hours. Again, there are schools fitting particularly the seasonal trades. In such schools the street pavement layer, stonemason, or bricklayer is given instruction for two or three months continuously during the time of year when his usual occupation is made impossible by weather conditions. He is then excused from all instruction for the remainder of the year. In such cases the apprentice usually draws a half or two-thirds wage for the period of school attendance.

The various German States differ considerably in compelling attendance upon continuation school instruction. Such instruction is compulsory in Prussia and Bavaria and in some of the other States, while it is almost invariably optional in the free cities like Hamburg, Bremen, Lubeck, etc. In other places compulsion is brought about through the labor unions before issuing certificates of admission to the union. Under these conditions it may be easily understood that the German trade-union may be depended upon to force attendance upon continuation school instruction of all apprentices coming within their jurisdiction. It is to be remembered that the employer on the Continent of Europe is much more likely to be a graduate of continuation schools than is the English or American manufacturer.

ENGLAND.

England and Wales are recent converts to the compulsory continuation school which they have provided for in their educational legislation after a careful study, in order "to conserve the wageworker of the future and meet the German program of industrial training."

In August, 1917, a bill, an extract of which will be found in Appendix B, page 48, was introduced into the British Parliament providing for compulsory full-time and part-time education. Some time later this bill was withdrawn because of the opposition of the local school authorities, with an agreement that a new bill be introduced in January. The new bill, which passed on its second reading March 19, 1918, provided for changes in the administrative features, but retained the provisions of the original bill as far as the hours and age of attendance of the pupils are concerned.

After the second reading the bill was sent to a committee under whose consideration it may be subject to further change; but the provisions which appear to be permanent and those of principal importance are as follows:¹

The English system presented in these bills is built up on compulsory full-time education to 14 years of age, while no child under 12 may be employed in any capacity. Up to 18 years of age, after leaving public school, compulsory continuation school attendance in the daytime for 320 hours a year, that is, 8 hours a week for 40 weeks, is obligatory upon all local systems. The local board may raise the 14-year limit for full-time compulsory schooling to 15, if desirable, and may make certain exemptions for pupils between 14 and 15 years of age. The national board may increase the number of hours for part-time instruction per week after five years. The employer may be required to excuse these pupils from employment with pay, not only during the time which they attend school, but also for additional hours not to exceed two if such extra time is needed to get the pupil in proper mental and physical condition for his school work. Part of the work in the continuation school must be physical instruction. Young persons failing to attend, and parents evading the act, are fined.

Supervision is also given over health conditions in child-employing plants, over holiday and school camps for continuation school pupils, over centers and equipment for physical training including athletic fields, baths, swimming pools, etc. and over other facilities for social and physical training.

As stated before, there has been some opposition to the administrative features of the act and they are still subject to change. In brief, it is provided that the national board have final supervision; that the local board cooperate with the other authorities in establishing free continuation schools of a variety of types and submit its plans to the National Board of Education for approval. The law also provides for provincial associations made up of educators, employers, and representatives of employees' associations. The national board is to distribute parliamentary grants of money for this education.

In the last analysis, England is aiming, first, to continue the general education on a foundation built up by the elementary school; second, to give vocational insight and civic teaching; third, to look upon young people as subjects for education and not as parts of an industrial scheme; and fourth, to provide adequate training and sufficient salaries for teachers of the highest type.

¹ This information was secured from Anna Rochester, author of "Child Labor in Warring Countries." It was gleaned from the latest readings of the educational supplement of the London Times and clippings from recent English newspapers.

FRANCE.

France, long one of the strongest exponents of vocational day-school instruction, has come at last to a serious consideration of part-time schooling. At the time this bulletin was prepared M. Viviani had introduced a bill into the Chamber of Deputies "to establish a system of continuation schools and to require part-time school attendance during working hours of all working children under 17 years of age." The bill had the endorsement of the minister of commerce and of the most influential business interests in France.

VI. FORMS OR TYPES OF PART-TIME SCHOOLS.

Three forms of vocational part-time schools are now to be considered in greater detail, and what has already been said will have made the definition of these schools clear.¹

1. The general continuation school.
2. The trade preparatory school.
3. The trade extension school.

THE GENERAL CONTINUATION SCHOOL.

The general continuation school, as the name implies, should devote itself particularly to providing a general educational background upon which to build a superstructure of vocational training. It must determine what proportion of the total part-time instruction is needed for this work. Such information can be obtained by a survey of its pupils to find out how far they are below the minimum educational qualification, which may be described as being equivalent to that in general provided by an elementary grammar school. The character of its work, while depending upon this survey, must necessarily have a decided civic leaning, and at the same time be clearly connected with the vocational program, since these schools are established under authority given in that part of the act which specifies that any subject given to enlarge the civic or vocational efficiency of pupils may be given in a part-time school. The school must safeguard the pupil from hasty and inefficient instruction, but it must be borne clearly in mind that the pupil's receptive period is brief and that he is both physically and mentally ready and eager to secure practical industrial training, and will not take kindly to an extended course which neglects his natural desires.

THE TRADE PREPARATORY SCHOOL.

The trade preparatory school must justify itself by actual success in taking pupils from one occupation and preparing them to enter another. The burden of proof that this can be well done in a part-time scheme rests with the school. Such schools or classes

¹(Examples are given in Appendix C, p. 51.)

must select type trades usually learned either in a short apprenticeship or by not more than a year of "helper service," and must in each case determine that the amount of time available for instruction is adequate to give such a knowledge of the new trade as will be a permanent benefit to the learner.

Despite the ambition of its administration such a school must rigidly refrain from attempting to teach trades which, because of the length of time needed for their mastery, can not properly be given in intermittent instruction. For instance, a trade requiring four years' apprenticeship at eight hours per day before the issuance of a journeyman certificate would require 1,200 or 1,400 weeks at eight hours per week of continuation school instruction if the school alone were depended upon to give all the training needed.

It is possible that the trade preparatory school may act somewhat like a prevocational school in assisting its pupils to "find themselves" in industry. The part-time trade preparatory school bears a closer relation to the all-day trade school than either of the other types.

THE TRADE-EXTENSION SCHOOL.

Part-time trade extension work will undoubtedly be the most popular in this country, as it has been abroad. Such schools are devoted exclusively to extending and amplifying the instruction which an apprentice is receiving during the day while regularly employed at the trade which he is studying in school.

The student receives instruction for a few hours a week; in some cases he may be a half day in the school and a half day in the commercial shop; in others he may have alternate days or alternate weeks in shop and in school; or two weeks of constant instruction may be followed by the same period on the shop floor. Still other courses are laid out to cover the slack seasons, when apprentices in the trade may be excused for one, two, or three months of continuous school instruction. Whatever may be the arrangement regarding the time of instruction, certain fixed principles must be accepted by the trade extension school as a part of its general policy.

In common with the trade preparatory school, the trade extension school should prescribe for trade courses an educational prerequisite that will insure elementary school graduation or equivalent general continuation school work. It must seek out also every possible point of contact between the instruction in the school and the work which is being done by the pupil in the shop, even when it is only an indirect contact. Trade extension work must give the worker an appreciation of the entire trade and of his place in the whole scheme. Except in short unit courses it must confine its principal efforts to teaching the theory of the trade, leaving the skill to be provided in the

commercial shop. In short unit courses, however, practical training along specific lines of trade processes and operations may be undertaken.

TYPICAL TRADE-EXTENSION COURSES.

Following is a typical example of a part-time trade extension course:

MACHINE-SHOP APPRENTICES, CINCINNATI, OHIO.

- (1) Attendance of 110 machine shop apprentices from 11 firms—
4 hours weekly for each of the 4 years of apprenticeship.
- (2) Age: Over 16 years.
- (3) Courses:
 - Shop drawing.
 - Shop mathematics.
 - Shop science.
 - Study of tools and materials.
- (4) Teacher: A technically trained man.
- (5) Result: Journeyman standing as a machinist after successful completion of the four years shop and school work.

The academic work is not necessarily related to shop work—but may be. In general it includes some form of drawing, mathematics, science, English and civics.

The work of the trade extension school is related to the work of the night school, and the two may well be studied together.

It is interesting to note how shadowy at times becomes the borderline between trade preparation and trade extension classes, and how necessary it is to set up each trade-preparatory class on its own merits. In the following example, messenger boys who are not apprenticed telegraphers, but who are employed in telegraph service and have access to commercial instruments, are being trained as telegraphers:

WESTERN UNION MESSENGER BOYS, CINCINNATI, OHIO.

- (1) Attendance of two groups of boys on alternate weeks. Four hours per day.
- (2) Age, between 15 and 18 years.
- (3) Course—
 - Spelling, English.
 - Use of typewriter.
 - Study of Morse Code and instrument operating.
 - Civics.
- (4) Teacher—one teacher handles all subjects including telegraphy. She is a skilled operator.
- (5) Result of instruction—
 - Messengers who pursue the work for two years become eligible for beginning places as telegraphers.

COOPERATION BETWEEN SCHOOL AND SHOP.

All part-time work entails close and active cooperation between the school and the shop and a perfectly definite understanding as to what shall constitute the work and duties of each in the general plan. Such cooperation usually requires a reorganization of shop methods of handling apprentices. This can be best accomplished in the following ways:

By agreement as to just what trade experience the shop shall provide and just what technical education the school shall provide. Some sort of an advisory committee will be useful in this regard.

By trade agreements covering hours of work and hours of schooling; increased wage with increased shop training and school work; graduation of shop experiences; assurance of employment upon completion of schooling.

By coordination between shop experiences and school work. This may be established by a coordinator who has access to both school and shop, or by the part-time teacher who follows the boy into the shop and thus learns the boy's problems.

PART-TIME INSTRUCTION FOR WOMEN.

While this bulletin has been written with the training of men for trades and industries particularly in view, practically all the principles are applicable also to the training of women in home economics and in trades and industries. Up to the present time the bulk of the work which has been given in part-time schools for women has been of the general continuation type, primarily for home making and without special regard to advancing the women in wage-earning occupations. Since the wage-earning period usually precedes the home-making period, it is very much to be desired that the State and local authorities give more careful attention in future to the possibilities of training women for wage-earning occupations, and especially to the possibility of giving such training in trade preparatory and trade extension classes. The training of women in part-time schools, short unit courses, and on the shop floor to replace men drawn from essential industries by the draft has given this phase of industrial education a very new and important place in trade educational schemes. At this time not only private firms and local authorities are studying this problem, but New York State and the Federal Board are carrying on a cooperative investigation of the entire field as it exists in the Empire State.

PRINCIPLES COMMON TO ALL PART-TIME EDUCATION.

In concluding this section, let it be pointed out that there are a few general principles common to all part-time education regardless of specific designation.

Every school should deliberately plan to improve industry and industrial methods of production and administration, through a study of the problems and difficulties continually presented in the schools. It should use every means, direct and indirect, to promote civic training without actually giving courses in civics.

Classes should be grouped according to age as well as mental capacity. The evening schools in the British Empire were a failure for years largely through the grouping of men and young boys in the same class.

Classes should be formed wherever most convenient, in school, store, factory, or shop, and should not be confined to educational buildings. The schools must aim to supply well-defined local needs rather than to borrow their courses from some general propaganda. Courses must have sufficient elasticity to meet the needs of individual pupils.

It is particularly necessary that instruction in the part-time schools be organized about specific needs because of the limited time during which workers are in schools, and because part-time education can be justified upon no other basis than that the school has a particular function and message for the group.

Each part-time class should be composed of workers having similar needs, and instruction should be organized about these needs. A recent observation of a part-time class not organized as above indicated, serves to illustrate the validity of the two basic principles enumerated. The class was composed of about 30 boys between 14 and 16 years of age who were required to return to the school eight hours each week. There were 2 cotton glove cutters, 2 cigar factory workers, 3 machinist apprentices, 4 errand boys, and 6 delivery boys, the remainder being employed in 12 miscellaneous occupations. The technical instruction included two hours of machine-shop drawing, and two hours of machine-shop mathematics, while the four hours of academic instruction included English, spelling, geography, history, and physical training. It was said that the employers felt justified in giving the boys time to return to school, because the technical instruction made them more efficient in their factory work. As a matter of fact, the technical instruction was related to the work of but three of the whole group and, even with these, the lack of coordination between shop problems and school instruction, made the work entirely academic. The city was large enough so that youths with similar needs could have been enrolled in separate classes, thus making the instruction purposeful.

Many mistakes similar to those just mentioned would be avoided if the part-time schools and classes would submit their courses of study to advisory committees of representative employers and

employees. The following is quoted from a report by Mr. A. E. Holder of the Federal Board and of the American Federation of Labor:

Boards of education or township trustees administering approved vocational schools and departments for industry, agriculture, or domestic science education shall, under a scheme to be approved by the State board for vocational education, appoint an advisory committee composed of members representing local trades, industries, and occupations.

It shall be the duty of the advisory committee to counsel with and advise the board and other school officials having the management and supervision of such schools or departments.

VII. THE SHORT-UNIT COURSE IN PART-TIME SCHOOLS.

Where used for the instruction of apprentices, a short unit course should be one of a series of such courses, the whole forming a definite and logical course of instruction. The object of the individual short unit is the improvement of journeymen who have specific needs which are often detached from each other and which do not lend themselves readily to anything but a short, definite, practical training.

It is not possible here to give extended space to examples of short unit courses, but since this phase of part-time school work is not well understood and is destined to be widely used in the near future, it has seemed advisable to offer illustrations of each of the two types referred to.

THE SERIES OF SHORT-UNIT COURSES.

The general course for concrete workers includes these unit courses:

	Lessons.
BC-37. Principles and disposition of reinforced concrete.....	5
BC-38. Reinforcing metals and their physical properties.....	10
BC-39. Mechanics applied to reinforced concrete.....	5
BC-40. Systems of reinforced concrete.....	5
BC-41. Theory of beams and slabs.....	15
BC-42. Theory of columns.....	5
BC-43. Foundations and retaining walls.....	5
BC-25. Figuring costs of large structures over \$100,000.....	50

These courses in concrete construction may be taken in any order as offered.

THE INDIVIDUAL SHORT-UNIT COURSE.

Milling-machine operations:

Plane milling.

Gear cutting.

Milling cutters (plane and angular).

Fluting.

Boring.

A journeyman machinist of several years experience who knew his trade thoroughly might yet be weak in universal grinding operations and desire a brief special unit course like the following:

Universal grinder:

Grinding between centers, parallel and taper work.

Grinding cutters (plane and angular).

Without previous or subsequent courses or related work, a machinist apprentice or helper would not be able to do this with profit—he would need a coordinated group of unit courses something like the following:

UNIVERSAL GRINDING.

A. Handling machine.
B. Internal grinding.
C. External grinding.

D. Magnetic grinding.
E. Surface grinding.

VIII. FEDERAL AID FOR PART-TIME SCHOOLS.

RESERVATION OF FEDERAL FUNDS FOR PART-TIME INSTRUCTION.

Perhaps the most important step in the development of part-time education in the United States is contained in the Smith-Hughes Act, approved by Congress February 23, 1917—with a provision for the use of Federal moneys specifically set aside to promote and stimulate the establishment of part-time schools.

This act appropriates three funds to be disbursed by the Federal Board for Vocational Education among the States for the support of vocational training. These funds are to be used in assisting the States to pay the salaries of supervisors and teachers of agricultural subjects, the salaries of teachers of trade, home economics, and industrial subjects, and for the maintenance of training courses for the preparation of teachers in these vocational subjects. The amount of money that has been allotted for trade, industrial and home economic education to the whole United States for the next 10 years is shown by Table 1 given in Appendix A.

The total appropriation made by Congress for the salaries of teachers of trade, home economics, and industrial subjects was in round numbers \$500,000 for the fiscal year 1917-18. By an increase of approximately \$250,000 annually the total of this appropriation increases to something over \$3,000,000 for the fiscal year 1925-26 and annually thereafter. This appropriation is allotted to the States in proportion to their urban population, meaning by this, population living in communities of over 2,500, as shown by the last preceding Federal census.

In order to secure the expenditure for part-time training of a just amount of the allotment of money to each State from this

appropriation, the Smith-Hughes Act requires "that at least one-third of the sum appropriated to any State for the salaries of teachers of trade, home economics, and industrial subjects shall, if expended, be applied to part-time schools or classes for workers over 14 years of age who have entered upon employment."

It will be noted that while no State is required to spend any money for part-time education for young wage earners, one-third of the fund is set aside for this purpose and must be so used or not used at all. Furthermore, it would be entirely permissible under the act for much more than one-third of the fund to be used for part-time training. Indeed, the whole fund may be so expended.

FEDERAL MONEY MATCHED.

The Smith-Hughes Act requires that for every dollar used from a Federal fund allotted to a State for the salaries of teachers of vocational subjects there shall be at least another dollar expended from State or local funds or both for the same purpose. Assuming that the State and local communities together spent just enough on the salaries of teachers of part-time work to match the Federal dollar, at least the following sum would be expended for the stimulation and support of part-time schools or classes during the next 10 years:

Minimum amount available for part-time schools and classes for workers over 14 years of age, by years.

Fiscal year ending June 30—	Minimum amount available for part-time schools and classes		
	Total of Federal and State or local money.	Federal money: One-third of appropriation for trade, home economics, and industrial subjects.	State or local money: To match Federal appropriation.
1917-18.....	\$377,333.34	\$125,666.67	\$125,666.67
1918-19.....	530,666.66	265,333.33	265,333.33
1919-20.....	689,333.34	344,666.67	344,666.67
1920-21.....	852,000.00	426,000.00	426,000.00
1921-22.....	1,016,666.66	508,333.33	508,333.33
1922-23.....	1,181,333.34	590,666.67	590,666.67
1923-24.....	1,346,000.00	673,000.00	673,000.00
1924-25.....	1,704,000.00	852,000.00	852,000.00
1925-26.....	2,033,333.34	1,016,666.67	1,016,666.67
Annually thereafter.....	2,033,333.34	1,016,666.67	1,016,666.67

ADDITIONAL PROVISION BY THE STATES.

The table given above does not show the expenditures for plant and equipment which the schools must make to carry out such a program. It does not give the expenditures necessary to meet the other costs of maintenance besides teachers' salaries. Experience

shows that the costs of general maintenance equal at least one-half the cost of teachers' salaries, which would, for example, increase the total amount to be expended for the fiscal year 1926-27 from \$2,000,000 to \$3,000,000. This does not take account, however, of the probability that when compulsory part-time schools have been established by a large number of the States their expenditures for the salaries of teachers in such schools may become much greater than the amount received from the Federal fund for that purpose.

EXPENDITURES FOR HOME ECONOMICS.

The figures above, however, include the expenditures for home economics part-time instruction, in the accounting of which some confusion may arise. The act provides that not more than 20 per cent of the amount apportioned to any State for trades, industry, and home economics may be expended upon home economics courses. This includes the amounts used for all-day, part-time, and evening courses under the following conditions:

All Federal aided day work in home economics is to be counted a part of this 20 per cent.

All Federal aided evening work in home economic subjects except that given specifically as trade training for women working in industry is counted as part of the 20 per cent.

All part-time work for home economics except that given in the general continuation classes is counted a part of the 20 per cent.

The home-making courses in general continuation classes are charged to that one-third of the money required for part-time instruction but not to the 20 per cent maximum allowed for home economics, whereas all other home economics in part-time classes is chargeable to both funds, the one-third part-time, and the 20 per cent home economics.

REQUIREMENTS OF THE FEDERAL ACT AND POLICIES OF THE FEDERAL BOARD.

The liberal provisions of the Smith-Hughes Act regarding part-time schools and classes is proof of the growing importance which the country allots to this plan for training those who have gone to work before completing their general or their vocational education. Moreover, these provisions are certain to have such far-reaching consequences that they must be of deep interest to all those concerned in the movement for the better education of wageworkers. These considerations justify at this point a rather extensive discussion of the requirements of the act, and of the standards and policies of the Federal Board for Vocational Education regarding part-time schools and classes.

The Federal board will look upon the administration of the Smith-Hughes Act as a joint partnership enterprise entered into by the Federal Government and the various State governments. It considers itself a joint trustee with the State boards for vocational education in carrying out the provisions of the act, in providing for proper instruction and supervision of the work done in the part-time school, and in cooperating with any and all of these schools in the problems which will continually arise as this type of vocational training progresses.

It is expected that each State will originate its own plan for carrying on the instruction provided for in the act, and for the training of teachers to instruct in the schools established. The Federal board has already issued several memoranda and bulletins for the purpose of assisting the States in formulating their plans, and will continue this assistance through subsequent publications and through the work of its staff and regional agents.¹ The action of the board in this matter is purely advisory—each State is expected to draft its own plan to meet its own particular needs, at the same time conforming to the requirements of the Smith-Hughes Act.

When a State plan is completed and approved by the State board for vocational education it has to be submitted to the Federal Board for Vocational Education for approval. When the plan has received the joint approval of these two boards, it becomes the basis of the joint-partnership before mentioned, and the dealings of the Federal board with the State board for vocational education will in general relate to the carrying out of this plan.

Certain general provisions applicable to every type of school reimbursed from Federal funds, and, therefore, to part-time instruction, must be incorporated in every State plan.

The act provides that the schools or classes shall be under public supervision or control, thus excluding all private and correspondence courses, factory and corporation schools, private apprenticeship work and the like. The controlling purpose must be to fit for useful employment, thus excluding all types of manual training and general education schools when not definitely fitting for some productive employment. The work, again, must be of less than college grade, and thus leaves out of account the technological institutes, engineering colleges, and State agricultural and land grant colleges.

The State itself, or the local communities of the State, must provide for such schools and classes a plant and equipment at least equal to that approved by the Federal board as a minimum in that State for instruction in the trades or industrial pursuits to be taught.

¹ Reference may be made especially to the section on part-time schools in Bulletin 17 on "Organization and administration" of trade and industrial education.

In addition, the State must expend each year for the maintenance of this school or class at least the minimum amount fixed by the State board and approved by the Federal board.

Whatever the nature of these schools or classes may be, if they are to share in the Federal aid for part-time instruction, they must provide for not less than 144 hours of instruction per year, such instruction to be given by teachers possessing at least the minimum qualifications for doing this work. These qualifications are determined for each State by its State board with the approval of the Federal board.

It is provided further that the "subjects in a part-time school or class may mean any subject given to enlarge the civic or vocational intelligence of such workers over 14 and less than 18 years of age." This provision leaves the State free to open part-time trade extension, trade preparatory, and general continuation school courses, and to receive Federal aid for such classes in any such course designed to contribute directly or indirectly to the civic or vocational up-building of students between 14 and 18 years of age.

RECENT RULINGS ON PART-TIME EDUCATION.

For the purpose of encouraging the rapid development of part-time education and increasing the number, variety, and enrollment of part-time classes, the Federal Board has recently made some important rulings concerning section 11 of the Federal act, which reads as follows: "that at least one-third of the sum appropriated to any State for the salaries of teachers of trade, home economics, and industrial subjects shall, if expended, be applied to part-time schools or classes for workers over fourteen years of age who have entered upon employment, and such subjects in a part-time school or class may mean any subject given to enlarge the civic or vocational intelligence of such workers over fourteen and less than eighteen years of age; that such part-time schools or classes shall provide for not less than one hundred and forty-four hours of classroom instruction per year."

Recent interpretations by the board of clauses in the section above quoted provide as follows:

Workers over 14 years of age who have entered employment may be interpreted to include persons definitely scheduled for employment in a trade or industrial occupation by written agreement with the employer in order that they may be given instruction in a class fitting them for advantageous entrance to such trade or industrial occupation. Such classes may also be open to those already employed who may receive better preparation in the occupation they are already following, and promotional training for a new occupation.

Any subject given to enlarge the civic or vocational intelligence may be interpreted to include instruction given in trade, home economics, industrial, commercial and general education subjects.

Such workers over 14 and less than 18 years of age should be interpreted as determining the character or grade of the instruction to be given rather than the age of the persons who were to be admitted to the class.

This action by the board expands the possibilities of the use of Federal funds in promoting part-time schools. The interpretation of this section of the law is as liberal as is legitimate according to the terms of the act. It will be noted that under this recent ruling no age limits are imposed as conditions of enrollment in part-time classes of any type.

COMMERCIAL SUBJECTS MAY BE TAUGHT.

It is to be noted further that under the above ruling of the board, and under other recent rulings also, part-time schools may be opened to pupils training in commercial subjects. Whereas the Smith-Hughes Act excludes commercial and general training from the work of all-day and evening schools, it has not excluded such training from part-time schools, because of the clause that any subject given to improve the civic or vocational efficiency may be taught in such schools. Communities, therefore, may now establish part-time commercial classes and cooperative part-time commercial courses for those over 14 years of age already employed, and may secure Federal aid for this work from the funds set aside for part-time instruction.

FEDERAL AID TO COVER ADDITIONAL COSTS.

As further evidence of the Federal board's interest in promoting part-time instruction, that shall be specifically devised to meet the varied needs of young workers, another recent ruling regarding part-time classes may be quoted, although in part it covers the ruling above quoted as regards scope of part-time work:

In order to reach as many as possible of the young people while they are employed and to make the provisions of the Federal vocational education act regarding part-time education encourage the rapid development of such education the following interpretation of section 11 of the act is made beginning with the fiscal year 1918-19:

1. Federal moneys may be used in part-time schools and classes for the salaries of instructors in trade, home economics, industrial, commercial, and general education subjects, as provided hereunder.

2. Such part-time classes must be classes which divide the working day or school time between instruction and practical work in shop, factory, home, office, etc.

(Note by the director: To divide means here not to separate the working day and school time into two equal parts, but to apportion or distribute the total working day so that a portion of it is given to school instruction; or to apportion or distribute the total school time so that a portion of it is given to employment in shop, factory, home, or office, etc.)

3. The subjects taught must be such as are designed to increase the civic and vocational intelligence of the pupil.

4. Federal moneys may be used for the payment of the salary of an instructor only in cases where it is shown that the cost of such an instructor represents an addition to the expenditures of the school system incurred because of the operation of such part-time classes over and above expenditures for regular classes.

5. Where such part-time pupils are taught in a regular day class already established so that the class does not represent an additional cost to the school system Federal moneys may not be used for the salary of the instructor of such a class.

6. All the other requirements of section 2 of the Federal vocational education act must be observed.

This action was taken by the board from a broad point of view concerning the meaning which could legitimately be given to the phrase "civic and vocational intelligence" in section 2 of the act. Under this interpretation it will be possible for the States to extend the number, variety, and enrollment of part-time classes.

Where a general continuation part-time school offers courses extending the regular education in elementary branches and offers also bona fide civic and vocational courses, Federal funds may be granted to such a school for the time actually given by its instructors to the civic and vocational work and also for the training in the elementary branches. But it must be shown in the latter case that this instruction is a continuation of the work which the wage-worker pupil failed to complete in school.

COORDINATORS IN PART-TIME SCHOOLS.

Close correlation of school instruction with shop work is regarded as being of vital importance in part-time work, and one means of insuring this correlation will be found, it is believed, in the appointment of coordinators. Regarding the use of Federal money for reimbursement of salaries paid to coordinators in part-time schools, the following announcement of policy has been made by the Federal board:

In order to encourage the States to develop part-time education under section 2 of the act and to provide proper correlation between the school and the shop, factory, home, office, etc., where the pupil is employed, this ruling is made, beginning with the fiscal year and ending June 30, 1919: "Instructors in part-time schools and classes paid in part from Federal moneys may serve also as coordinators of work between the school and the employment or work of the pupil. By coordinator is meant the person who supervises or correlates the class instruction and the practical experience of part-time students."

SPECIFIC BENEFITS OF INSTRUCTION.

For the benefit of those States contemplating the establishment of part-time instruction, it may be pointed out that the Federal board is not now disposed to define too closely the variety of work which now or in future will be entitled to national aid. A State may

include in its plan and submit for approval any subject whatever. But, in general—

Federal moneys will be used to pay the salaries of teachers employed in those part-time schools or classes where wage-working boys or girls receive any or all of the following benefits:

A. Increased skill or knowledge in the occupation which the wage-worker is following.

B. Skill or knowledge leading to promotion in the industry or calling wherein the wage-worker is engaged.

C. Improvement in the knowledge of regular subjects which the wage-worker did not complete in school.

D. Increased civic or vocational intelligence.

E. Skill or knowledge in home economics for girls employed as wage-workers.

The Federal board holds, also, that part-time instruction should be given during a portion of the working time of the pupil, and not before or after working hours. It also believes that the number of benefits at which such schools should aim must be governed by the number of hours of instruction which can be given. The aims should be few in order to insure the best results, and the pupils should be so grouped and taught as to deal definitely with one aim at a time, care being taken not to attempt inconsistent or conflicting aims with the same pupils. For example, a part-time class having but four hours per week for instruction should not attempt as a maximum for any one group more than two of the aims outlined above.

In approving the work of part-time schools and classes, the Federal board will hold the local board responsible for measuring the success of the school or class, both at the start and while under supervision, according to the standards which that school or class must establish to fulfill its declared aims. The State board should therefore require the local authorities to define clearly the aim or aims of such school or class and to provide the board with full knowledge concerning the course; the occupations engaged in by the pupils; the hours per day, week, month, or year given to instruction; the plant and equipment; methods of instruction and qualifications of teachers. The whole is to be measured, for approval, in terms of the benefits for wage-working youths set forth in the previously quoted paragraphs.

SPECIAL METHODS OF INSTRUCTION REQUIRED.

Part-time schools should not employ in the teaching of trade and shop classes the methods that are commonly used in the public schools, nor will superficial adaptation of these methods produce good results. As far as possible some method which permits of instruction while the pupils are doing work that closely follows the work of the commercial shop must be used for all classes except those

of the general continuation school type. As the Maryland plan expresses it, the pupils are to be taught in an atmosphere as nearly like that of the high-grade commercial shop as is possible under good school conditions.

The only teachers fully qualified to use these methods and to give instruction which shall in quantity and quality approximate that of the commercial shop, reach trade standards as to speed and accuracy, and at the same time really train the pupil, are those who have had actual trade experience in commercial production and who have had also special training in the methods of organizing and teaching industrial subjects.

IX. COMPULSION IN PART-TIME SCHOOL ATTENDANCE.

The decline of the apprenticeship system marks the decline of organized and incidental trade instruction. Youths are now employed not as learners but as producers and are so rated. If we are to retain all the advantages which modern production offers the young worker and, at the same time, are to place him again before the country as a learner, rather than as a producer, it must be done through some compulsory part-time education scheme.

Four types of law are more or less commonly used to bring about compulsory attendance:

The first places the responsibility on the child by prescribing a penalty for the student of compulsory age in a part-time school who absents himself without good reason. In the State of Wisconsin, at the present time, it is possible to arrest such absentees as vagrants.

The second type places the compulsion on the parent, providing fines or imprisonment, or both, for parents who neglect to send their children to school regularly and in such manner as the law directs. This is the most common American type.

Both of these types depend on the public-school authorities for the records necessary for their enforcement, and on some recognized local or State authority for the actual enforcement.

They forbid the educational administration officer in a community to grant a work certificate to any child within compulsory continuation school age without transmitting the name, age, and address of such child to the part-time school authorities, so that these authorities may know each day what children within their jurisdiction should be newly registered in the continuation schools. They then require the latter authorities to furnish these names and those of repeated absentees to some one body authorized to enforce compulsory attendance, which body might be attached to the administrative division of the continuation schools, to the administrative division of the regular schools (usually one and the same), or to the local police

authority. The use of the police authorities, however, is seldom resorted to except in aggravated cases.

The third type of law makes it a criminal offense for any employer to give employment to a child within the compulsory continuation school age, except when the work certificate of such child is accompanied by a registration blank signed by the proper school authorities showing that the pupil is registered in the continuation school, and is ready to be assigned to classes as soon as he secures employment, the employer in this case being required to notify the school of each minor employed. He is also required to notify the proper persons concerning minors who give up their positions, leaving it to the public attendance authorities to deal with all cases reported.

The fourth type puts the compulsion upon the labor union, and, through the central office of the union, requires the employers to report monthly the names of all apprentices employed, the attendance of such apprentices upon the continuation or evening school instruction, with a record of attendance for the month preceding. This latter method, which is in use in Central Europe, has not yet been made applicable to American conditions.

In none of these cases is the compulsion for attendance laid specifically on the school authorities. In most cases, however, direct responsibility is laid on the educational administration to provide the schools and classes in such number and locations as to make attendance reasonably easy, and to provide also an attendance officer to carry out the law and attend to the prosecutions.

There is no reason why the salient points of two or more of these laws should not be combined. It would seem that a State law would safeguard completely the attendance upon part-time continuation schools, if the law directed the proper educational officers to notify the proper continuation school officers of every child within their jurisdiction who left school between the ages set for compulsory part-time instruction; and directed the employer to notify the same continuation school authorities of every child entering into employment who is within prescribed age limits; and if in addition the law charged some one body with the enforcement of the rules of compulsory attendance, as relating both to day schools and to continuation schools.

Experience in foreign countries and most of the experience in this country has led the vocational teacher to look with the greatest favor upon compulsory attendance by State law. The effect of such legislation is wholesome not only for the pupil and his parents, but for the general school authorities, the employer, and the labor union. It gives definite support to the continuation school idea and a surer basis for expenditure of time and money by States and communities for the establishment of such schools.

X. PRINCIPLES WHICH SHOULD UNDERLIE COMPULSORY LEGISLATION.

While the Smith-Hughes Act does not require compulsory attendance, the vital problem in continuation school education in this country is the problem of making attendance compulsory. The initiative not only for establishing such schools but also for compelling the attendance of those for whom the schooling is provided must be taken by the States. It is not probable that State schemes for part-time education will develop materially until after the passage of State legislation authorizing and directing the formation of such schools, providing State funds for their support, and compelling attendance upon their instruction.

Permissive-mandatory laws like those of Indiana and Ohio are not likely to be effective for youths between 14 and 16, but may serve the purpose of trade extension classes for those over 16 and 17 years of age.¹ In these States at least such legislation has not been effective in promoting part-time education for a majority of the youth of either State. It seems possible, therefore, to lay down the following general principles which should be given careful consideration by any State whose authorities are contemplating compulsory part-time continuation school legislation:

1. To be really effective the law must be mandatory upon communities, parents, and employers, rather than permissive, and must provide penalties for failure to establish the school and for nonattendance when once established. It is also essential to the successful operation of such a law that the local communities be required to provide the necessary rules and regulations and a sufficient force of truant officers or inspectors to carry out thoroughly the regulations laid down by the State. From a report on the working of compulsory continuation school laws in one American city, the following adverse criticisms are taken:

- (a) Children are repeatedly absent from school for trivial reasons which would not keep them away from work.

- (b) The time which should be spent in school is frequently wasted in idling, moving pictures, street walking, and in other ways less beneficial than work.

It should be evident to anyone that these failures are not inherent in the law itself, but in the lack of facilities for enforcing the law in the particular city mentioned.

2. Financial assistance in the form of State and Federal aid must be provided by the State for local communities where such education becomes compulsory. Such assistance is now available under the Smith-Hughes Act as far as the National Government is concerned.

¹ R. J. Leonard, regional agent for industrial and trade education.

The State must make a similar appropriation if it expects to control and standardize the part-time work.

3. Laws must be sufficiently adaptable to make possible a practical program under the varied conditions within a State, such as size of the city, different occupations in different communities, community ideals, varying ages, educational background of pupils, etc.

4. The school must prescribe an entering age that will insure sufficient maturity for pursuing the courses with profit, remembering that reasonable age requirements will differ in different States.

5. Only pupils physically fitted for the instruction should be admitted.

6. An elementary education sufficient to insure that the pupil will understand the civic and vocational training offered should be prerequisite for entrance into all schools, unless provision can be made to furnish some part of this elementary education in general continuation school classes.

7. A fixed number of hours of instruction per year should be required, the total being sufficient to accomplish the ends for which the work is prescribed.

8. The schedule of hours within the day, week, or month must be flexible enough to cover occupations having rush and dull seasons, such as that of street pavement workers; occupations having slack days in the week, such as that of laundry workers, and occupations having slack hours in the day, such as that of barbers.

9. Instruction should be permitted wherever it can be given with the greatest efficiency. School authorities should be empowered to use and to pay for the use of any plant, equipment, building, etc., that will improve the part-time work.

10. School boards should be authorized to enter into trade agreements with employers determining length of instruction, division of same between school and shop, wages during and after instruction course, promotions to better positions, and similar matters.

11. Legislative authority should be given school boards to employ part-time coordinators to promote cooperation between the class work and the shopwork of pupils.

12. Certification of teachers and coordinators in part-time schools should be a matter of State regulation and should be entirely separate, so far as requirements are concerned, from the regulations governing public school-teachers in general schools. The ordinary written examinations given for licenses are not suitable for the selection of vocational teachers. Technical training, trade experience or contact, and pedagogical skill determined by confidential letters from references given by the applicant, supplemented by a practical examination for vocational work only, is far superior to general teaching examinations.

13. The State laws for part-time education must consider also contributory issues, such as wages, hours of labor, restrictive employments, issuance of working permits, and the compulsory education laws. When legislation forces employers to release minors for instruction during a part of the working day and to pay for such time off, the scale of wages will rise or fall according as the instruction given makes possible an increase of production through more skillful and intelligent service. All efforts to regulate the wage scale for these or similar pupils by arbitrary legislation have been unsuccessful in the United States.

14. Compulsory attendance legislation must function with State child labor laws in order to provide time and place for those forced to attend, and to safeguard the working of minors on Saturdays, Sundays, and holidays, before a certain morning hour and after a certain evening hour, as well as to prevent training for or working in industries unsuited for child labor. If employments harmful to minors are not already forbidden by law, the part-time legislation should prohibit training for such employment.

15. These laws must also insure cooperation between the schools and the department of vocational guidance.

16. They must function with general compulsory education laws and all other laws of the State to insure uniformity of purpose and to avoid conflicting legislation. Any law of this kind must take special cognizance of the general attendance laws of the State and its close relationship to them. For instance, raising the general compulsory attendance to 16 years of age would close practically all the part-time schools which have been provided to meet the needs of pupils between 14 and 16 years of age. In providing for compulsory part-time legislation all the laws of the State, especially those pertaining to education, school attendance, child labor, child welfare, restrictions of minors, factories, hours of employment, and workman's compensation, should be carefully scanned to prevent, what has not been uncommon in the past, one State law annulling or conflicting with some other law in the State.

17. In enforcing compulsory educational law the State board of education should work in close cooperation with the State department of labor. The inspection and supervision of pupils to insure proper educational facilities and inspection for the purpose of determining that school authorities are carrying out their part of the program, should be in the hands of the State board of education; while inspection, in so far as it relates to the employer and the place of employment, and the observance of the law by authorities other than those connected with the public schools, might well be left to the State labor department under the provisions of the child

labor and factory acts. A compulsory education law which binds together the common school authorities, and the continuation school authorities and the employers, safeguarded by the State board of education and the State department of labor working in harmony and with an appreciation of each other's problems could be efficiently administered. A suggested part-time compulsory attendance law taken from Mr. Holder's report to the American Federation of Labor is given in Appendix D.

XI. PART-TIME SCHOOLS AND THE WAR.

It only remains, in conclusion, to point out a possible relationship between compulsory part-time legislation and the nation-wide propaganda for increasing production as a war necessity.

So far as war emergency work is concerned, the universal desire is to provide all the suitable labor possible and to operate all machinery and equipment to the fullest extent. Releasing children between 14 and 16 years of age for further schooling will, at the start at least, cut down the number of employees on full time production. It may also cause the idleness of a certain portion of the equipment of the plant. For these reasons, such schooling may be seriously opposed by manufacturers and others just at this time, and it behooves the State authorities to investigate these phases of the matter carefully before forcing legislation during the war.

It must be remembered, however, that the ultimate effect of efficient part-time schooling will be an increase of production from each minor employed and a probable increase in the number of suitable minors available for employment. Moreover, a reorganization of the shop, especially in large plants, could be made so as to employ more minors than are needed to keep constantly busy all equipment provided for their use, thus leaving fixed groups to be sent in rotation to the part-time school without involving the idleness of any machine. This does not mean a surplus of labor, but a rotation of groups, keeping just the right number in the plant at all times and allowing the others to attend part-time classes.

In normal times there can be no question but that compulsory part-time education will so increase the civic and productive power of a State in a few years as to insure the complete approval of these schools and classes. During the continuance of the war, however, the State must determine, first, whether or not the decrease in production due to the opening of this work will be made up shortly by an increase due to superior skill and knowledge of the workers; second, whether or not this is the proper time to introduce part-time training; and third, what legislation looking to such introduction will best fit its own peculiar and particular needs.

Part-time classes may also be established in any State for the training of conscripted men or other men available for Army service in mechanical lines. Under a ruling of the Federal Board all classes organized to prepare men in special courses fitting for specific mechanical Army occupations may be subsidized from Smith-Hughes funds in the same manner as other classes are subsidized. One State has organized part-time classes for conscripted men, the employers agreeing to excuse these men from work without loss of pay during the time devoted to war training, and the State will expend most of its part-time allowance upon this kind of instruction. Employers by assisting in this plan will keep their employees on production for a longer period of time, employees will be able to remain at home during training, and the State will provide for its war mechanic quota without losing its citizens until they are actually inducted into Army service.

This has many advantages over any system of all day training that can be provided for these men.

APPENDICES

APPENDIX A.—STATISTICAL TABLES.

TABLE 1.—*Annual grant by the Federal Government for salaries of teachers in trade, home economics, and industrial education under the Smith-Hughes law.*

Year.	Amount of grant.		
	Total.	Allotted on the basis of urban population.	Additional to provide minimum allotments to States. ¹
1917-18.....	00	\$ 0	\$65,000
1918-19.....	00	0	46,000
1919-20.....	00	1, 0	34,000
1920-21.....	00	1, 0	24,000
1921-22.....	00	1, 0	25,000
1922-23.....	00	1, 0	22,000
1923-24.....	00	2, 0	18,000
1924-25.....	00	2, 0	56,000
1925-26.....	00	2, 0	60,000
Annually thereafter.....	00	2, 0	60,000

¹ These round-sum amounts specified in the act, in each case exceed the amount required to provide the actual minimum allotments under apportionment.

TABLE 2.—*Minimum amount available for salaries of teachers of part-time schools or classes, by regions and States: 1918-19.*

Region or State.	Fiscal year ending June 30, 1919.		
	Total of Federal and State or local money.	Federal money: One-third of appropriation for trade, home economics, and industrial subjects.	State or local money: To match Federal appropriation.
United States.....	\$529, 642. 34	\$264, 821. 17	\$264, 821. 17
Regions:			
I. North Atlantic.....	239, 508. 26	119, 754. 13	119, 754. 13
II. Southern.....	55, 654. 88	27, 827. 44	27, 827. 44
III. East Central.....	158, 230. 00	79, 115. 00	79, 115. 00
IV. West Central.....	34, 750. 80	17, 375. 40	17, 375. 40
V. Pacific.....	41, 498. 40	20, 749. 20	20, 749. 20
I. North Atlantic:			
Maine.....	4, 509. 80	2, 254. 80	2, 254. 80
New Hampshire.....	3, 313. 34	1, 666. 67	1, 666. 67
Vermont.....	3, 313. 34	1, 666. 67	1, 666. 67
Massachusetts.....	36, 949. 58	18, 474. 79	18, 474. 79
Rhode Island.....	6, 202. 72	3, 101. 36	3, 101. 36
Connecticut.....	11, 820. 58	5, 910. 29	5, 910. 29
New York.....	84, 950. 36	42, 475. 18	42, 475. 18
New Jersey.....	22, 547. 98	11, 273. 99	11, 273. 99
Pennsylvania.....	54, 745. 98	27, 372. 99	27, 372. 99
Delaware.....	3, 333. 34	1, 666. 67	1, 666. 67
Maryland.....	7, 781. 46	3, 890. 73	3, 890. 73

TABLE 2.—Minimum amount available for salaries of teachers of part-time schools or classes, by regions and States: 1918-19—Continued.

Region or State.	Fiscal year ending June 30, 1919.		
	Total of Federal and State or local money.	Federal money: One-third of appropriation for trade, home economic, and industrial subjects.	State or local money: To match Federal appropriation.
II. Southern:			
Virginia.....	\$5,633.76	\$2,816.88	\$2,816.88
North Carolina.....	3,765.16	1,882.58	1,882.58
South Carolina.....	3,333.34	1,666.67	1,666.67
Georgia.....	6,368.18	3,184.09	3,184.09
Florida.....	3,333.34	1,666.67	1,666.67
Tennessee.....	5,214.24	2,607.12	2,607.12
Alabama.....	4,379.42	2,189.71	2,189.71
Mississippi.....	3,333.34	1,666.67	1,666.67
Arkansas.....	3,333.34	1,666.67	1,666.67
Louisiana.....	5,870.04	2,935.02	2,935.02
Texas.....	11,090.72	5,545.36	5,545.36
III. East Central:			
West Virginia.....	3,333.34	1,666.67	1,666.67
Ohio.....	31,508.60	15,754.30	15,754.30
Kentucky.....	6,566.70	3,283.35	3,283.35
Michigan.....	15,688.94	7,844.47	7,844.47
Indiana.....	13,522.96	6,761.48	6,761.48
Wisconsin.....	11,873.56	5,936.78	5,936.78
Illinois.....	41,105.92	20,552.96	20,552.96
Minnesota.....	10,052.58	5,026.29	5,026.29
Iowa.....	8,039.92	4,019.96	4,019.96
Missouri.....	16,537.48	8,268.74	8,268.74
IV. West Central:			
North Dakota.....	3,333.34	1,666.67	1,666.67
South Dakota.....	3,333.34	1,666.67	1,666.67
Nebraska.....	3,675.04	1,837.52	1,837.52
Kansas.....	5,837.82	2,918.91	2,918.91
Oklahoma.....	3,785.02	1,892.51	1,892.51
Montana.....	3,333.34	1,666.67	1,666.67
Wyoming.....	3,333.34	1,666.67	1,666.67
Colorado.....	4,786.22	2,393.11	2,393.11
New Mexico.....	3,333.34	1,666.67	1,666.67
V. Pacific:			
Idaho.....	3,333.34	1,666.67	1,666.67
Utah.....	3,333.34	1,666.67	1,666.67
Arizona.....	3,333.34	1,666.67	1,666.67
Nevada.....	3,333.34	1,666.67	1,666.67
Washington.....	7,158.86	3,579.43	3,579.43
Oregon.....	3,630.22	1,815.11	1,815.11
California.....	17,375.96	8,687.98	8,687.98

TABLE 3.—Population, number gainfully employed, and number not in school, by sex and age periods and single years of age, 1910 and estimate for 1918.

Age.	Apr. 15, 1910. ¹					Estimate Apr. 15, 1918. ²		
	Popula- tion.	Number gainfully employed	Number not in school. ³	Percentage.		Popula- tion.	Number gainfully employed.	Number not in school. ³
				Gain- fully em- ployed	Not in school. ⁴			
MALE.								
10 to 13 years.....	3,885,779	808,030	65	16.6	10.8	3,970,000	660,000	420,000
10 years.....	946,561	.....	30	.....	10.4	992,500	.....	100,000
11 years.....	857,584	.....	70	.....	8.1	992,500	.....	90,000
12 years.....	969,732	.....	53	.....	10.8	992,500	.....	110,000
13 years.....	892,602	.....	61	.....	11.7	992,500	.....	120,000
14 and 15 years.....	1,798,449	744,100	30	41.4	25.6	1,990,000	820,000	510,000
14 years.....	935,974	.....	66	.....	19.3	996,000	.....	190,000
15 years.....	832,475	.....	44	.....	32.5	995,000	.....	320,000
16 to 20 years.....	4,564,179	3,615,622	49	72.9	74.0	5,240,000	3,820,000	3,880,000
16 years.....	925,246	.....	63	.....	50.7	1,048,000	.....	530,000
17 years.....	907,649	.....	01	.....	66.0	1,048,000	.....	690,000
18 years.....	949,876	.....	89	.....	77.9	1,048,000	.....	820,000
19 years.....	889,036	.....	22	.....	85.2	1,048,000	.....	890,000
20 years.....	899,372	.....	72	.....	90.7	1,048,000	.....	950,000
21 years and over.....	26,999,151	25,122,802	14	93.1	99.3	31,690,000	29,500,000	31,470,000
21 to 44 years.....	17,849,843	17,282,209	.....	96.7	.....	20,840,000	20,200,000	.....
45 years and over.....	9,149,308	7,840,593	.....	85.9	.....	10,850,000	9,300,000	.....
FEMALE.								
10 to 13 years.....	3,803,239	826,946	846,769	8.0	9.7	.....	310,000	360,000
10 years.....	921,972	.....	88,771	.....	9.6	.....	.....	90,000
11 years.....	847,497	.....	71,871	.....	8.5	.....	.....	80,000
12 years.....	943,020	.....	91,518	.....	9.7	.....	.....	90,000
13 years.....	880,741	.....	94,599	.....	10.7	.....	.....	100,000
14 and 15 years.....	1,770,898	350,140	432,143	19.8	24.4	.....	390,000	480,000
14 years.....	912,148	.....	166,071	.....	18.2	.....	.....	180,000
15 years.....	858,750	.....	266,072	.....	31.0	.....	.....	300,000
16 to 20 years.....	4,632,821	1,847,000	3,401,438	39.9	73.4	.....	2,100,000	3,870,000
16 years.....	939,465	.....	452,035	.....	48.1	.....	.....	510,000
17 years.....	889,591	.....	561,673	.....	63.4	.....	.....	670,000
18 years.....	979,490	.....	753,313	.....	77.0	1,048,000	.....	810,000
19 years.....	974,025	.....	781,118	.....	80.9	1,064,000	.....	910,000
20 years.....	984,250	.....	883,299	.....	90.5	1,054,000	.....	970,000
21 years and over.....	24,556,754	6,591,066	24,421,786	22.8	99.5	28,480,000	6,500,000	23,340,000
21 to 44 years.....	16,331,449	4,302,909	.....	26.3	.....	18,850,000	5,000,000	.....
45 years and over.....	8,224,305	1,288,117	.....	15.7	.....	9,630,000	1,500,000	.....

¹ United States Census: 1910.² In estimating population for 1918 it is assumed that the annual increase during the eight years since 1910 for the several age periods (10 to 13 years, 14 and 15 years, 16 to 20 years, 21 to 44 years, and 45 and over) has been one-tenth of the decennial increase shown for these age periods, 1900-1910. The estimated total for each period is evenly distributed within the period by single years, where these are shown separately. The number gainfully employed and the number not in school is estimated by applying the 1910 percentages to the estimated populations of 1918.³ Had not attended school of any kind in the current school year.

APPENDIX B.—EDUCATION BILL OF 1917, FOR ENGLAND AND WALES.

PROVISIONS OF THE BILL.

1. Elementary education:

- A. Compulsory full time education to 14 years.** Fifteen years to be substituted in all local by-laws as the maximum school attendance age. Local boards are to grant exemptions as they see fit between the ages of 14 and 15 years. (This does away with the part-time attendance provisions existing in some industrial centers according to which children 12–14 worked half the day.) No child shall be allowed to leave school on attaining the statutory age. He must complete the current term. No child under 12 years of age shall be employed. A child over 12 years may not be employed on any day on which he is required to attend school before the close of school hours nor before 6 a. m. or after 8 p. m. (This permits child labor of children over 12 on Saturdays, Sundays, and holidays.)
- B. Abolition of fees in public elementary schools.**
- C. Establishment of nursery schools for children under 5 years.**

2. Continuation schooling:

- A. School attendance.** Young persons up to the age of 18 shall attend continuation school during the daytime for 320 hours a year, i. e., 8 hours a week for 40 weeks. After 5 years the board of education may order an increase of number of hours. No school attendance during holiday or half holidays. Local education authority may require that on the day when attendance is required at a continuation school the pupil's employment shall be suspended not only during period for which he is required to attend school but also for such additional time not exceeding 2 hours, necessary that the pupil may be in a fit mental and physical condition to receive full benefit from attendance at school. Part of this education to be physical. Fine of 5 shillings to be imposed on young person who fails to attend. Fine not exceeding 5 pounds for parent who attempts to evade act.

B. Medical and physical care. The local education authority on report of the school medical officer may prohibit or attach such conditions as they see fit to the employment of a young person if they are satisfied that the child is being employed in a manner prejudicial to his health. Local education authorities may maintain—

1. Holiday or school camps for continuation school pupils. (Not military camps.)
2. Centers and equipment for physical training, playing fields, school baths, and swimming baths.
3. Other facilities for social and physical training.

3. Administration. The Board of Education to have final supervision. The local education authorities either separately or in co-operation with other local education authorities to establish and maintain free continuation schools with suitable courses of instruction and physical training. The local education authorities after such consultation with persons or bodies interested as they consider desirable shall submit to the Board of Education schemes for the progressive organization of a system of continuation schools. The Board of Education may make such alterations as they see fit. The Board of Education may provide for the establishment of provincial associations for such areas as the board may direct. Such scheme shall be made after consultation with the authorities appearing to the board to be concerned, and shall¹ provide for the representation of authorities and may provide directly or by cooperation for the inclusion of persons interested in the administrative or educational work of the area and of representatives of universities and other bodies. Board of Education may make grants in aid out of money provided by Parliament to local associations.

[Brief summary of Mr. Fisher's speech in Parliament introducing his education bill, and of the subsequent debate. From full text in London Times educational supplement August 16, 1917, by Irma Achstein.]

MR. FISHER. The bill is prompted by deficiencies which have been revealed by the war—the industrial pressure upon the child life of the country. These conditions reveal the absolute necessity that physical education be included in continuation school work. The school attendance provision amounts to this: That young persons who are not undergoing full-time instruction will be liberated from industrial toil for the equivalent of three one-half days a week during 40 weeks. Two half-days to be spent in school, while one will be a half holiday.

Under the terms of the bill the local authorities are compelled to consult industrial and other interests and to establish a variety of types of schools.

The schools are to continue the general education on the foundations of the public elementary schools, and to give it an additional vocational bias with the aim to produce good citizens.

Are 8 hours a week for 40 weeks sufficient? Having regard to the practical objections that it would be difficult to provide teachers of ability, that

¹ This evidently provides for representation of employers and workers associations.

It would require large expenditures and a disturbance in the juvenile labor market, I came to the conclusion that 8 hours per week would be the practical starting point. At the same time, I should not like it to go abroad that I gave the period of 8 hours a week as an ideal. Young people should be regarded as subjects of education and not as parts of the industrial machine. The bill makes provision for the extension of hours at some later time.

Industrial efficiency will be increased and the employers will get their return in the development of the industrial character of the people.

The only objection to the bill came from one member who believed the proposals for raising the school age would not be approved by the people who had to obey the law. The spirit we were developing was the spirit of the anarchist and could not benefit England (a refreshing whiff of mid-Victorian economy).

The favorable points emphasized were: That the local education authorities work out their schemes in consultation with the chief employers and workers' organizations; that it was important that these schemes be in working order before the demobilization of troops after the war; and that the success of the continuation scheme depended on the teachers. Provision must be made for the adequate training of teachers and for adequate salaries for those teachers.

APPENDIX C.—PROPOSED NEW STATE LAW PROVIDING FOR COMPULSORY PART-TIME EDUCATION AND PART-TIME EMPLOYMENT.

COMPULSORY SCHOOL-ATTENDANCE LAW FOR CHILDREN BETWEEN 14 AND 16 YEARS OF AGE.

[From a report by Mr. A. E. Holder.]

Any city, town, or district establishing vocational, trade and industrial schools, departments, or classes shall provide as a part thereof part-time classes for the education of minors over 14 years of age who are engaged in regular employment; and the board of education or trustees or other like body of such city, town, or district school shall require all minors between the ages of 14 and 16 years employed within such city, town, or district, or minors between the ages of 14 and 16 years residing within such city, town, or district and employed elsewhere, who are not otherwise receiving instruction approved by the State Board for Vocational Education, to attend such part-time classes not less than — hours per week between the hours of 8 a. m. and 5 p. m. during the school term. The time spent by any such minor in a vocational school or class as provided herein shall be reckoned as a part of the time or number of hours that minors are permitted by law to work. Any minor attending a vocational school or class in the city, town, or district of his residence in preference to attending such school or class in the city, town, or district of his employment shall file, or cause to be filed regularly, at least once a month, with the superintendent of the city, town, or district at which such minor is employed a report of attendance, certified by the superintendent of the city, town, or district in which such minor is attending school.

SEC. 2. The employer of any minor between 14 and 16 years of age who is compelled by the provisions of this act to attend vocational schools or classes, shall cease forthwith to employ any minor when notified, in writing, by the superintendent having jurisdiction over such minor's school attendance, that such minor is not attending school in accordance with the provisions of this act. Any employer who fails to comply with the provisions of this section shall, upon conviction, be punished by a fine of not less than \$10 nor more than \$100 for each offense.

PUBLICATIONS OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

Annual Report for 1917.

The Vocational Summary, published monthly by the Federal Board for Vocational Education (Vol. I, No. 1, May, 1918).

Bulletin No. 1. Statement of Policies.

*Bulletin No. 2. Training Conscripted Men for Service as Radio and Buzzer Operators in the United States Army (International Code).

Bulletin No. 3. Emergency Training in Shipbuilding—Evening and Part-Time Classes for Shipyard Workers.

*Bulletin No. 4. Mechanical and Technical Training for Conscripted Men (Air Division, U. S. Signal Corps).

Bulletin No. 5. (Reeducation Series, No. 1.) Vocational Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 166.)

Bulletin No. 6. (Reeducation Series, No. 2.) Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 167.)

*Bulletin No. 7. Emergency War Training for Motor-Truck Drivers and Chauffeurs.

*Bulletin No. 8. Emergency War Training for Machine-Shop Occupations, Blacksmithing, Sheet-Metal Working, and Pipe Fitting.

*Bulletin No. 9. Emergency War Training for Electricians, Telephone Repairmen, Linemen, and Cable Splicers.

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Bulletin No. 13. (Agricultural Series, No. 1.) Agricultural Education—Organization and Administration.

Bulletin No. 14. (Agricultural Series, No. 2.) Reference Material for Vocational Agricultural Instruction.

Bulletin No. 15. (Reeducation Series, No. 3.) The Evolution of National Systems of Vocational Reeducation for Disabled Soldiers and Sailors.

*Bulletin No. 16. Emergency War Training for Radio Mechanics and Radio Operators.

Bulletin No. 17. (Trade and Industrial Series, No. 1.) Trade and Industrial Education—Organization and Administration.

Bulletin No. 18. (Trade and Industrial Series, No. 2.) Evening Industrial Schools.

Bulletin No. 19. (Trade and Industrial Series, No. 3.) Part-Time Trade and Industrial Education.

All communications should be addressed to
The Federal Board for Vocational Education, Washington, D. C.

* Emergency war training for conscripted and enlisted men.

BULLETIN No. 20

**TRADE AND INDUSTRIAL
SERIES No. 4**

**BUILDINGS AND EQUIPMENT
FOR
SCHOOLS AND CLASSES IN
TRADE AND INDUSTRIAL
SUBJECTS**

**ISSUED BY THE
FEDERAL BOARD FOR VOCATIONAL EDUCATION
WASHINGTON**

NOVEMBER, 1918

**WASHINGTON
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1918**

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FOREWORD.

Although the Smith-Hughes Act does not permit the expenditure of Federal moneys for plant or equipment for the schools established or in part supported by that act, yet through the provision which requires approval by the Federal Board of standards for plant, equipment, and maintenance, the Federal Board is directly interested in these problems. It has, therefore, fallen naturally within the sphere of the Board to collect and prepare the material which is now presented in this bulletin.

The attempt is made to summarize the best experience of industrial trade schools in the United States, so far as it relates to buildings, their location, arrangement, and mechanical or instructional equipment. In every instance due consideration is given to the character of the work to be performed in the buildings, and in addition to general specifications, typical equipments for several of the more important trades are given in detail. In the light of our present experience, however, it is not possible to anticipate the requirements of the various unit trades of a special nature, such as making precision instruments, making watches, optical work, and so on, which may develop further in the near future. As these needs develop it is planned to issue new bulletins on special unit trades.

Acknowledgment is made to Rogers & Manson Company for permission to use several cuts of plans formerly used in "The Brick-builder" in an article on Trade and Industrial Education by Lewis Gustafson.

Part I of this bulletin surveys the whole field of trade and industrial education, from the point of view of buildings and equipment for type schools and classes. Part II, a discussion of equipment, courses of study, and methods of instruction in carpentry, was prepared as the first of a series of articles which will treat in a similar manner all of the more common trade subjects. These articles will be issued by the Federal Board in future publications. The bulletin has been prepared by J. C. Wright, special agent of the Federal Board of Vocational Education.

C. A. PROSSER,
Director.

BUILDINGS AND EQUIPMENT FOR SCHOOLS AND CLASSES IN TRADE OR INDUSTRIAL EDUCATION.

PART I. TYPE SCHOOLS AND CLASSES.

I. PROVISIONS OF THE SMITH-HUGHES ACT.

The provisions of the Federal act for vocational education not only require the State or local community to prepare teachers for vocational schools, departments or classes, but also require the State or local community to furnish an adequate plant and equipment, and an annual sum for maintenance. The policy of the Federal Board relating to plant, equipment, and maintenance is stated in the following paragraphs quoted from Bulletin No. 1.

It will not be possible at the present time to establish in most of the States absolute, or quantitative, standards with regard to minimum plant and equipment and with regard to the minimum amount to be expended for maintenance. While the right to establish such standards rests with State boards, the standards themselves must have the approval of the Federal Board. For the present the Federal Board will hold State boards responsible only for determining that the plant and equipment in the case of any school or class are adequate to carry out the purposes for which the school is established, and that the amount expended for maintenance is sufficient to insure reasonable standards of work and to secure teachers prepared properly to do that work.

The general limitation contained in the statute in regard to plant and equipment is contained in section 17. This section declares that no portion of any moneys appropriated under the act for the benefit of States shall be applied directly or indirectly to the purchase, erection, preservation, or repair of any building or buildings, or equipment, or for the purchase or rental of lands, or for the support of any religious, or privately owned or conducted school or college. If, therefore, the entire cost incident to utilizing the laboratories, etc., of the institutions referred to is borne by the State and consequently no portion of any Federal funds will be used either directly or indirectly in connection therewith, there will be no objection to State boards using plants and equipment of the character indicated.

That the State or local community, or both, shall provide the necessary plant and equipment determined upon by the State board, with the approval of the Federal Board for Vocational Education, as the minimum requirement for such education in schools and classes in the State. * * * (Sec. 10.)

II. A DISCUSSION OF INDUSTRIAL SCHOOL BUILDINGS vs. GENERAL SCHOOL BUILDINGS.

1. Comparative Floor Space Required.

Standards for general school buildings require 15 to 24 square feet of floor space, and 200 to 250 cubic feet of air space per pupil in the classroom.

These values are based upon many years of experience with the general school. The usual classroom is approximately 22 by 32 feet and accommodates 45 pupils. This space is inadequate for industrial shop classes. During the past 20 years manual training has come into the course of study as a supplementary type of general education, with one to three hours per week in the upper grades of the elementary schools and three to five per week in the high school. It is not possible to give in these classes more than general principles and to educate the pupil to an appreciation of industrial problems. Conclusions based on experience in manual training schools do not furnish an adequate basis for determining the amount of floor space needed in trade and industrial schools.

2. Floor Space in Existing Schools.

In elementary schools manual training shops have usually been placed in class or basement rooms, many of which are small and possess poor light, heat, and ventilation. In high schools architects usually make more adequate provision for shops than in elementary schools.

The following table shows the floor space given to different shops in several existing cosmopolitan high, technical high, and trade schools.

Square feet of floor space.

School.	Wood- work- ing. shop.	Wood- turn- ing.	Forg- ing.	Ma- chine shop.	Elec- tical.	Mason- ry.	Pat- tern shop.
Soldan High, St. Louis, Mo.....	2,180	2,440	1,800	2,070	.....	.....	.....
North East High, Kansas City, Mo.....	1,794	1,716	1,056	1,716	.....	.....	.....
David Ranken, Jr., School of M. T., St. Louis, Mo.....	4,324	.....	4,312	5,170	2,450	2,450	2,116
Milwaukee Trade School, Milwaukee, Wis....	5,336	.....	5,336	5,336	5,336	.....	5,336

3. Need for Industrial School Buildings.

The rapid growth of industrial schools is a development of the educational system designed to meet the demand in the industries for more skilled workmen, foremen, and superintendents.

The situation is rapidly becoming serious and must be met by a system of industrial training which will supply the ever-increasing demands of industry for intelligent man power. To meet this

demand, trade and industrial schools are needed. Pupils must be given such experience and trade training as will fit them to enter successfully upon industrial employment. This education requires a new type of school building.

III. TYPES OF SCHOOLS AND BUILDINGS.

1. Types of Schools.

The Federal act provides for all-day, part-time, and evening vocational schools. Buildings which meet the needs of the all-day school will usually be satisfactory for part-time and evening classes. Where part-time classes are organized for general education, the ordinary classroom will be suitable. Since trade extension and related subjects are usually given in the part-time or evening school, it is desirable to provide facilities for these subjects in all new or remodeled buildings.

2. Types of Buildings in General Use.

The trade or industrial training may be given in a separate school or in a separate department of a general school. Where the work is given in a separate school, three kinds of plants are to be found in this country: The special building erected for the purpose, usually by an issue of bonds; the old factory building remodeled for the purpose; and the abandoned schoolhouse which has outlived its usefulness for general education and is remodeled to serve temporarily for industrial training.

(a) **THE SPECIAL SCHOOL BUILDING.**—Such schools as the Williamson Trade School near Philadelphia, the Wentworth Institute at Boston, the William Hood Dunwoody Institute at Minneapolis, which are private schools; and the Worcester (Mass.) Trade School for Boys, and the Milwaukee Trade School for Boys, which are publicly supported, are quartered in *special buildings built for the purpose*.

This seems to be a wise and safe course to pursue in cases where the local authorities are certain that they know just what kind of a building is needed to meet the local situation. It insures proper conditions for doing the work from the start. There is danger that the building will not meet the changing conception of the service which the school should give its pupils. Experience seems to show that where a special building is erected as a *general trade school* for giving industrial education, it is advisable to build on a unit basis, each unit being devoted to one or more trades, and new units being added from time to time to meet the needs of the school.

In some cities the tendency is toward a *unit trade school* for printing, for machinists, for textile workers, and for other trades for which the local community needs skilled men or women.

(b). **CONVERTED BUILDINGS.**—Such schools as the New Bedford and Springfield, Mass., independent industrial school and the Industrial School at Rochester, N. Y., occupy old factory buildings which have been remodeled so as to provide for a time at least fairly adequate accommodations for the school. This method of housing the work can be resorted to successfully in communities where funds are not available to provide a special building or when the school authorities have not determined upon the kind of a plant required to meet their changing ideas of what the school should do.

The old factory building, however, is often poorly adapted to school purposes. Sometimes the location is bad; usually the lighting poor and the heating arrangements inadequate. Such a building should properly be regarded as a makeshift or device to be used for a brief period as the first step in the introduction of industrial education in the community.

Such schools as the Newton, Mass., Bayonne, N. J., and New Orleans industrial schools are quartered in *old schoolhouses* which have been remodeled. This method of introducing industrial education is good when the community is carrying on a small experiment or beginning in the work. By beginning in this way, school authorities are able to find out what would be done on a large scale in the case of every kind of training. Further, an opportunity is thus given to prove the worth of the work before larger public funds are asked for.

Abandoned schoolhouses are seldom adapted to vocational work. The lighting is usually poor; the rooms are not the right shape and size; and the construction of the building is not adapted to the use of machinery.

Some States are attempting to solve the problem of industrial education by utilizing *separate departments in general high schools*. While the children in the department of vocational education might well participate in the social activities of the school, the best results will be secured when their training is given in a distinct unit of the building, erected or set apart for this purpose. The difference in the character of the work which they are carrying on requires such a separation for most of the day.

IV. TYPE EQUIPMENT—THE PROBLEM OF EQUIPMENT.

1. How Much Equipment is Needed?

If the pupil is to be adjusted to meet the demands of industry, his training must be real. If it is real, it must be given in a shop making things on a useful or productive basis. Schools giving training in such subjects as woodworking, metal working, electrical work, etc., can readily find use for the work of the pupils either in the building itself or in the school system. Every school should make a part of its own

equipment. This has been done by most of the industrial and trade schools. Enough equipment ought to be bought at the outset to start the work and to enable the school to operate on a productive basis.

Where schools find themselves with limited resources at the start, some secondhand equipment for use in the first year of the course can be bought. In the other years of the course it is necessary to secure the very latest and best machinery, so that when the boy leaves the school he will be familiar with the latest equipment and able to take his place in industry.

One of the handicaps under which the school shop must always labor is that of keeping its machinery fully abreast of the best equipment of the commercial shop. It is doubtful whether this can be done successfully. Under the stress of competition, the commercial shop changes its equipment from time to time. Without such connection

ERRATA.

The statement on page 12, paragraph 3, "Such schools as the Newton, Mass., Bayonne, N. J., and New Orleans Industrial Schools are quartered in old schoolhouses which have been remodeled," is in error.

The school at Newton, Mass., has for several years occupied a splendid new modern building erected to meet its vocational needs. In New Orleans the plans were drawn and the building constructed with the end in view that the school be opened as a trade school for girls.

J. C. WRIGHT.

amount of equipment to enable the boy to acquire the elementary practice and experience at the machines and with the tools and in the processes which the shop denies him and which are necessary to his insight, interest, and growth in the occupation. All experience goes to show also that a minimum amount of the equipment must necessarily be under the school roof in order that the teacher may closely correlate or connect the instruction which he is giving with the shop processes as they can be illustrated on the machines.

2. What Kind of Tools Should be Provided?

One great mistake which many manual training and technical high schools have made, and which industrial schools are in danger of making, is that of providing a large number of tools and machines

of one kind rather than a smaller number of different tools and machines. The same amount of money put into a more varied equipment would enable the school, whether it be a manual-training school or trade school, to deal with pupils individually, so as to give each a wider range of experience with different machines, to substitute the individual for the group method of instruction, and to approximate more nearly the conditions of real shopwork so necessary in the successful training of skilled workers in industry.

3. The General Industrial School.

The Federal act provides that for cities of less than 25,000 population the State board, with the approval of the Federal Board, may modify the conditions as to length of course and hours of instruction per week.

The Federal Board is of the opinion that, in making such modifications, the number of hours of instruction per week should in no case be less than 25 or the number of hours of instruction per day less than 5, a total of 300 minutes. Where no large employing industry exists in these cities general industrial schools may be organized. This type of school gives to the pupil a general training in industrial subjects. One-half of the five-hour day must be given to shopwork on a useful and productive basis.

This is the only type of industrial school which seems feasible in cities of this size, because there is not enough demand on the part of any industry for new employees to justify unit trade training as in the case of an all-day trade school, where a boy spends all of his time training as a machinist, carpenter, plumber, or printer. In the general industrial school, the idea is to fit the boy with some experience in shopwork in several typical trades, such as carpentry, electrical work, automobile work, and in connection with this shopwork to give him instruction in related drawing, science, and mathematics and in such nonvocational subjects as are needed for a well-rounded course of instruction.

To carry out this scheme the school shop, instead of having a carpenter shop filled with carpenter benches and a printing shop full of printer's cases, would be equipped with the small number of tools and machines necessary to give, in an elementary way, experiences in different occupations.

4. Obligation of the Local Community.

In establishing a trade or industrial school, department, or class, the State or local community must assume the responsibility of providing the necessary plant and equipment. This must in all cases be adequate to meet the needs of the class for the trade to be taught.

V. NEW BUILDING FOR TRADE OR INDUSTRIAL EDUCATION.

1. Location.

In locating a new trade or industrial school, care should be taken to locate the plant on a site sufficiently large to provide for additional units needed to meet the growth of the school. The site should be chosen so as to accommodate the entire city from the standpoint of street car and other facilities. Experience shows that industrial schools can cooperate with industry to a greater advantage when the school is situated near an industrial center. This, however, does not warrant locating vocational schools in districts where the social and sanitary conditions are undesirable.

In the preparation of this bulletin a questionnaire was sent to nine industrial or trade schools of different types asking, among other things, for an opinion as to "What factors should determine the selection of a site for a new trade or industrial school?" The replies of the schools are given in separate paragraphs below.

"Avoid crowded space. The plant should be far removed from saloons, pool halls, and other things that tend to distract pupils. The school should be accessible to its pupils. This is particularly desirable for evening school instruction to day workers. A spur track is desirable."

"Avoid dangerous influences, questionable neighborhoods, etc. Locate site near good car lines. Have ample space for recreation and future additions. Give the school as fortunate surroundings as would be given to any other school."

"Accessibility for majority of pupils who would attend. Near business center. Proximity to factories or industrial center is not important factor. Should have as much dignity as a high school site."

"Kind of trades to be taught—manufacturing or building. If the school is cooperative, locate near industrial plants; if all-day school, this factor need not be considered."

"Should be accessible to street cars. Away from factories using soft coal. Away from tenements where many children are in the street. Adjacent to business section. Accessible to customers and pupils. Site should be large enough for outdoor activities."

"If possible, avoid noisy factory districts. Within one block of transportation. Lot to have room for recreation, light, ventilation. The residential district of the pupils."

"Good car service. Facilities for cooperating with industries. Character of the neighborhood should be such as to bring the pupils into contact with no undesirable influences. Grounds should be large so as to accommodate the school for the present and future, and give light, ventilation, and space for recreation."

"Avoid a noisy, sooty, squalid district. The site should be accessible and near manufacturing plants. Good environment and located so as to come within the general notice of the public."

"Good car service. Large area to allow for good athletic field and for expansion. In industrial center."

2. Construction.

It is not the intention of the Federal Board to set up plans and specifications for the construction of buildings which may be used for schools receiving Federal aid under the terms of the Smith-Hughes Act, but rather to call the attention of the States and local communities to some conditions which increase the efficiency of the plant and equipment.

Many States have laws regulating the construction of factories and public school buildings. These regulations should be observed in connection with the local building code.

Architects and school authorities should study the characteristics of the modern trade school and incorporate in the design of proposed buildings such requirements as have been found necessary to meet the demands of trade training. In planning a new building, the architect should provide shop floor space of from 100 to 200 square feet per pupil, depending upon the particular kind of industrial work for which the shop is to be used. In shops requiring the installation of woodworking or metal-working machinery, a larger floor space must be available. Ceilings should be constructed from 13 to 32 feet in height. Rooms for class recitation, mechanical drawing and laboratories should provide a floor space of from 50 to 90 square feet per pupil. In planning a new school building, care should be taken to provide for adequate tool and stock rooms in which to store all of the general tools and stock used for instruction in the shop. Tool and stock rooms should be provided with shelving and lockers suited to the needs of the particular industry for which the shop is used. As a part of their course in any trade pupils should be given instruction in the care of the tool and stock rooms, so that they may be taught to preserve and care for their own tools and equipment.

3. The Factory Type of Industrial School.

The construction of the factory type must be of such a character as to provide a large amount of light. Extra light may be obtained by means of northern sawtoothed skylights, and thus avoid the glare of the direct sunlight. Windows should be planned to occupy as much of the exterior wall space as the construction and architecture of the building will permit. It is desirable that the windows be of factory construction with small panes, so that accidental breakage will not cause large expense for replacement. In the construction of the floors, a knowledge of the purpose for which the room is to be used is necessary.

Each individual trade should be considered from the standpoint of its necessities under commercial conditions, and the plan made to provide necessary floor space, light, door openings for admission of large work, and freight elevator service.

Architects should not specify cement floors for shops in which edged tools are used, as it is impossible to avoid dropping tools on the floor. Whenever possible, wooden floors are preferable in such cases. Floors in which heavy machinery is to be installed should be designed to sustain the floor load weight with a sufficient safety factor to support future additions to the equipment. It is not always necessary to plaster interior walls. The roof construction, like the floors, necessitates on the part of the architect a knowledge of the purpose for which the room is to be used. Provisions should be made for numerous inserts in the ceiling and for suspending shaft hangers from steel girders whenever metal-working machinery is to be installed.

Ample locker space, wash and toilet rooms should be provided. The requirements for sanitation should be carefully observed. In planning the wash and toilet rooms of the new buildings, a careful study should be made of the flushing systems, and the location should be convenient to the shop rooms. It is not desirable to place wash rooms or toilet rooms in basements where the problems of sanitation are greatly increased.

The power plant installed in a new building offers an opportunity for giving courses in power-plant operating in steam and electricity, and therefore should be installed with these courses in mind. The engine room should be large and well lighted, and in most cases should be located so as to be convenient to the electrical department. This will permit the use of the generators, motors, and the switch-board for testing purposes in power-plant operating.

Schools engaged in project work will often find it necessary in the construction of certain projects to utilize several shops for the different kinds of work involved. When the building is planned, the shops should therefore be located with these conditions in mind, so that the least amount of confusion will result in moving projects from one shop to another.

It is recognized that the amount of light required per square foot in industrial plants is usually larger than in other buildings. Schools located in northern latitudes require more glass surface for natural light than do those located in central or southern latitudes. The wiring for electric lights should be calculated so as to provide for additional service when needed. Switchboards should be located in the room and fitted with a lock and key as a protection to the machinery. Whenever possible all wiring should be in conduit.

All machines should be supplied with drop-lights fitted with shades and safety appliances to meet the requirements of the State factory laws.

In the same way that modern architecture provides for the location of furniture in modern homes, the construction of a new building for

teaching trades should provide for the installation of the equipment. Woodworking machinery should be arranged for efficient service in routing the material through the machines. All machines making smoke, sawdust, or shavings should be connected to an exhaust system.

4. Division of the Interior.

(a) TEMPORARY OR MOVABLE PARTITIONS.—Trade and industrial education is comparatively new in this country. It is growing very rapidly through a series of developmental stages, and no one is able to forecast accurately what the needs of any one institution will be a few years from now. *Permanent interior bearing walls* should be avoided as a means of providing greater flexibility in adjusting interior partitions to the needs of changing conditions in the shops and classrooms.

(b) KINDS OF ROOMS AND RELATIVE FLOOR SPACE.—Whatever type of building may be selected, the interior will be divided into rooms for shopwork, science, drafting, classrooms, and rooms for administrative purposes.

The Federal act requires that a specified time shall be devoted in day schools to practical work. In addition, sufficient time for proper teaching must be given to instruction in related or technical subjects which are also vocational. The remaining time should be given to nonvocational subjects “necessary to build well-rounded courses of instruction.”

While not yet making at this time a definite and final ruling, the Federal Board points out that the experience in vocational education in trades and industries gained by this country during the last 10 years has established the following as the prevailing practice:

(a) In day industrial or trade schools, at least one-half the time is given to practical work on a useful or productive basis.

(b) From 30 to 35 per cent of the time in such schools is given to related studies, like mathematics, drawing, or science.

(c) The remainder of the time (15 to 20 per cent) is given to such subjects as English, civics, hygiene, and history.

The following table shows the relative amount of floor space usually given to each of these rooms:

Relative amount of floor space.

Kind of room.	Size of class recommended.	Average floor space required per pupil.	Total floor space.
		<i>Square feet.</i>	<i>Square feet.</i>
Shop.....	10-15	100-200	1,500-3,000
Related subjects.....	10-20	50-90	1,000-1,800
Nonvocational subjects.....	10-25	20-35	500-700

It is clearly seen from this table that a large portion of the building must be devoted to shops. Since the primary purpose of a trade or industrial school is to fit the individual for useful and productive employment, the building must be planned to give the individual actual shop experiences, and the equipment and methods used must closely follow the best practice of the industry.

5. Replies to Questionnaire.

The same nine schools replying to the inquiry regarding proper site for a school were asked to describe the type of building which should be selected in a design for a new trade school.

The replies were as follows:

"The building should be constructed along the lines of a *modern factory* of reinforced concrete, brick facing, with large windows, and ample ceiling height. The *governing idea* should be *flexibility*, the idea being to erect sectional partitions adjacent to shops and conduct each trade on a unit basis. Open plumbing, sufficient openings for light and power, gas and water, so that shops and classrooms can be enlarged or changed into other lines. Cast-iron inserts should be placed in the concrete ceilings on 4-foot centers so that shafting can be conveniently erected."

"Factory type with great flexibility. No permanent interior bearing walls. 'A loft subdivided to suit the tenant' is the important feature of the building. Design rooms for ample natural light in all shops and classrooms."

"Most approved methods of shop and factory construction for shops. Office construction should be used for classrooms. Maximum of utility, minimum of ornateness. Include both gymnasium and auditorium. Provide factory elevator to shops on upper floors and wide doorways."

"The kind of trades to be taught and number of pupils to be accommodated. Character of academic branches to be taught."

"A combination school and factory type. Rooms well lighted and ventilated. Dressing rooms and lockers on each floor. Simple finish and sanitary details."

"Attractiveness as distinguished from factory appearance. Make layout so that offices, classrooms, and shops are arranged for the best routing of material and projects."

"Factory type. Great flexibility in the interior. Unit construction. Materials and designs such as will make it possible to utilize the construction for 'project work.' Changeable interior to meet new conditions. Simplicity in construction. Factory facilities for routing material."

"Concrete construction which embodies fire protection, economy, and simplicity. Large rooms for shops."

"The best factory design."

An examination of these replies shows that the consensus of opinion regarding type of building is that the building should have "flexibility." That is to say, it should be designed so as to be capable of alteration to meet new conditions readily. In addition, the design should be such as to permit of a maximum of utility for the purpose in view. While the several schools, having in mind different conditions, differed in matters of detail, there was no essential divergency of opinion on these points.

VII A DETAILED DESCRIPTION OF A BUILDING AND EQUIPMENT FOR A TRADE OR INDUSTRIAL SCHOOL.

1. The General Plan.

The experienced school architect can not alone solve the problem of combining the school and the factory. It will be necessary for him to obtain certain specific information by conferences with the school authorities. This information should include—

- (a) The general character of the school.
- (b) The number and kind of trades to be taught.
- (c) The number of pupils the school shall be designed to accommodate.
- (d) The relative time to be given to shop, related, and nonvocational work.
- (e) A list of the equipment to be installed.
- (f) The amount of money available for the plant and equipment.
- (g) The facilities needed for assembly rooms, gymnasiums, lunchrooms, and administrative quarters.
- (h) A general scheme for the floor plan, showing the arrangement and location of rooms, based upon efficient teaching and administration.

In addition, there should be frequent conferences between the architect, the principal, and the shop teacher, so as to assure a plan based upon the combined experience of the builder, the school administrator, and the journeyman teacher.

As a final check upon the flexibility of the building, for trade-school purposes and upon its design on the "trade unit" basis, the plans of the architect should be carefully checked by a comparison with other schools of a similar character, and with the best industrial plants. This comparison should be made jointly by the school authorities and the architect, and may be made from plans obtained from other schools or by personal visits and conferences with school officials in other cities.

Experience in the administration of trade and industrial schools is favorable to the "trade unit" plan. The design of the unit plan provides that all the school work shall be carried out and organized with a particular trade or industry in mind. Each trade should be allotted a given portion of the building, and all instruction connected with that trade should be carried on within the department. This includes the shopwork and related science, mathematics, and drawing. As a means of securing greater "flexibility," the room in which the related instruction is given should be near the shops. This arrangement will enable the instructors to connect the practical shopwork with the related instruction, and will make available much of the shop equipment for laboratory purposes.

Experience also demonstrates that from 10 to 15 pupils constitute an average class in shopwork, and from 10 to 20 in related subjects; also that the school should be constructed so that the pupils

will be placed in situations which closely resemble the conditions of the trade or industry. To do this, the *factory type of school building* constructed on a "unit basis" has proven to be the most satisfactory.

A much larger floor space will be required, and more light and ventilation will be necessary than is common to school buildings. Factory windows and northern saw-toothed skylights should be constructed whenever possible. Interior partitions should be of light construction so as to be easily moved for the convenience of shops and classrooms. The floors should be designed with a large safety factor for installing additional equipment. Electric light and power service should be run in conduit with numerous switch boxes having extra capacity and extra light and power outlets.

Tool and stock rooms may serve two or more shops. Rooms for applied science, drawing, and mathematics will be more efficient, if located near the shop. Ample provision should be made to deliver supplies and to remove from the shops the finished product.

Windows should extend nearly to the ceiling, and should be set with as little space taken up by mullions as possible. The area of the glass surface should in general equal one-fourth of the floor space.

Since the interior of a vocational school resembles the factory, the construction will be less expensive per cubic foot than the general school.

2. A Typical Shop.

A concrete example of the foregoing statements may be had from the following description of a typical shop:

- (a) Size: The floor space should be from 1,500 to 3,000 square feet.
- (b) Light: On two sides, and supplemented by skylights whenever possible. The window-glass area should not be less than one-fourth the area of the floor space.
- (c) Floors: Should be wood or wood paving blocks in all shops where edged tools are a part of the equipment.
- (d) Walls: Brick unplastered for exterior walls. Tile or light frame for interior partitions.
- (e) Ceilings: Vary from 13 to 32 feet. High ceilings for carpentry, electrical work, and plumbing.
- (f) Heating and ventilation: About 5 to 10 degrees less than for usual classrooms. Ventilation not less than 40 cubic feet of air per pupils per minute.
- (g) Stock, tool, and supply rooms: Adequate to contain full length supplies. These rooms may be combined for two or more shops. Drying rooms for lumber and glue work are necessary for wood-working shops.
- (h) Related subjects room: Located close to shop for greater correlation of subject matter and convenience of teacher.
- (i) Electric light and power: Extra light in shops, with extra light and power outlets for equipment.

- (j) Plumbing: Toilet and wash room facilities should be accessible to all shops. One water-closet to each 15 pupils; one urinal for each 15 boys. Four lavatories, and one drinking fountain for each shop.
- (k) Cases for storage: Provide adequate cases for storing tools and supplies.
- (l) Blackboard: Each shop should have not less than 80 square feet of blackboard.
- (m) Benches and fittings: Full size and fitted with vises, etc., as in a commercial shop.
- (n) General tools and machinery: Should be commercial tools of average capacity and represent the industry of the community.
- (o) Individual tools: Usually one set for each pupil in the class. Edge tools should be individual. Special hand tools in lots of one or more and kept in tool room.
- (p) Red Cross cabinet: Containing sterile dressings for cuts and wounds, and other simple first-aid apparatus.

3. General Specifications.

Room.	Floor area (square feet).	Ceiling height in feet.	Minimum ratio glass sur- face to floor area.	Kind of floor.	1 electric- light outlet per 100 square feet floor area (wattage).	Average temper- ature in 0° weather.
						<i>Degrees.</i>
Machine shop.....	1,800-4,000	12-14	1:4	Wood.....	125	60-65
Carpentry.....	1,800-4,000	18-32	1:4	Wood.....	100	60-65
Masonry.....	1,800-3,000	13	1:4	Cement.....	100	60-65
Sheet metal.....	1,800-3,000	13	1:4	Wood or ce- ment.	100	60-65
Plumbing.....	1,500-3,000	18-32	1:4	Cement.....	100	60-65
Shop electricity.....	1,500-3,000	18-32	1:4	Wood.....	100	65-70
Automechanics.....	1,500-3,000	13	1:4	Cement.....	125	60-65
House painting.....	1,500-3,000	13	1:4	Wood or ce- ment.	125	65-70
Related science.....	1,000-1,800	13	1:4	Wood.....	125	70
Mathematics.....	500- 700	13	1:5	Wood.....	80	70
Related drawing.....	700- 900	13	1:4	Wood.....	125	70
Nonvocational subjects.....	500- 700	13	1:5	Wood.....	80	70

NOTE. —This is not intended to include all the shops which may be provided.

4. Machine Shop.

A typical machine shop should be equipped with up-to-date machines, such as will enable the school to turn out productive work in commercial quantities. The installation of equipment should be arranged for routing the work from one machine to another with the greatest efficiency. Tool and stock rooms, locker and wash rooms, should be provided to accommodate the needs of the shop.

The machine shop should be located on the ground floor and near other shops which do work related to machine-shop practice. When the plan of the building will permit, saw-tooth skylights should be used, as well as factory windows.

The following is a brief list of the general tools which the equipment should include for a class of 10 to 15 pupils:

6 8-foot benches with 3½-inch machinist vises, tops built up of 3-inch stock on edge.

6 Metal working lathes of different capacities and makes, including at least one turret and one taper turning attachment. One quick-change gear lathe should be included. High-speed and carbon-steel tools should be provided. Many of these can be made in the shop.

1 Planer with a capacity of not less than 8 feet.

1 Shaper not less than 16 inches.

1 Universal milling machine.

1 Back-geared drill press—capacity not less than 24 inches.

1 Two-wheel grinder.

1 Forge and anvil, }
1 Annealing furnace. } Unless otherwise provided.

1 Bench punch and shear.

Sets of taps and dies, and hand tools, adequate to accommodate a class of 10 to 15 pupils.

Adequate supplies of steel, iron, and brass castings, for use in work on productive projects.

Value of equipment, \$5,000 to \$15,000.

Annual cost of supplies per pupil, \$10 to \$15.

5. Carpentry.

The following is a description of a typical shop for carpentry and its allied trades. Whenever the woodworking industries of the community are large enough, unit trades in carpentry, cabinet making, mill work, etc., should be established.

Woodworking shops need a large amount of floor space. They should contain woodworking machinery, carpenters' benches, and from 1,000 to 2,000 square feet of floor space available for the assembly and construction of productive projects. The installation of the woodworking machinery should be planned when the room is designed, so that provision may be made for shafting and for arranging the machines for routing material economically from one machine to another. All machines should be connected to an exhaust system to remove the shavings and sawdust. The exhaust system may be motor driven, and arrangements made for an automatic control which starts the exhaust motor whenever any woodworking machine is being operated.

Tool rooms, lumber rooms, locker, and wash rooms should be provided in the plans.

As most lumber is received without being thoroughly kiln dried, it is desirable to have a drying room fitted with steam coils properly ventilated, in which to store lumber to be used in project work.

Woodworking shops also need a glueing room, in which facilities are provided for heating stock and warming glue.

The selection of equipment should include only tools that are recognized by the trade as standard.

For 10 to 15 pupils, the equipment should include:

- 1 12-inch saw table,
 - 1 Jointer,
 - 1 Hollow chisel mortiser,
 - 1 24-inch planer,
 - 1 Power sander.
 - 1 Glue pot.
 - 10 to 15 sets of hand tools.
 - Supplies of dimension and finish lumber for productive shop work.
 - Value of equipment, \$1,000 to \$3,000.
 - Annual cost of supplies per pupil, \$10 to \$15.
- } Or one Universal wood worker if floor space is small.

6. Electrical.

The work of a general electrical shop includes shopwork in house wiring, armature and field winding, power-plant operation, telegraph and telephone, and general repair work. In some schools it will be possible to have separate rooms equipped for each of these occupations. Each shop should be equipped with the usual tool and locker rooms, and in addition they should be supplied with adequate electrical power facilities for experimental and practice work.

Rooms in which instruction in house wiring is given will need a large amount of floor space on which to erect panel partitions, and even full-size buildings for practice wiring.

In the construction of the building a large number of outlets should be left in the walls and floors for future electrical connections. These should be connected to a switchboard by means of over-size conduit, so as to enable future changes in the capacity or number of conductors.

Equipment for electric wiring for 10 to 15 pupils:

- 1 skeleton house constructed of full-sized material.
- 10 to 15 sets of hand tools (hammers, pliers, screwdrivers, etc.).
- 2 sets of brace and bits with angle and bit extensions.
- 1 standard high-reading ammeter.
- 1 standard low-reading ammeter.
- 1 standard high-reading voltmeter.
- 1 standard low-reading voltmeter.
- 2 motor-generator sets.
- 2 testing magnetos.
- 2 sets of stocks and dies.
- 2 soldering irons and torches.
- 2 sets of pipe cutters.
- 3 annunciators.
- 1 12-inch or 14-inch engine lathe with screw-cutting attachment.
- A stock of motor and generator parts, armatures, transformers, and magnets for wiring practice.
- 1 gas furnace and soldering irons.
- Benches with machinists' vises for pupils' use in practice work.
- Supplies of bell wire, new code rubber-covered wire, bells, push buttons, conduit, metal molding, flexible conduit, duplex wire, and lamp cord, etc.

Fittings for pipe and metal molding, outlet boxes, pull boxes, switch-board fittings, solder, and flux, etc.

Value of equipment, \$1,000 to \$3,000.

Annual cost of supplies per pupil, \$10 to \$15.

7. Printing.

Rooms to be utilized for instruction in printing should be lighted on two sides and with northern light if possible. The light should be diffused over the entire room, and the glass area larger than that furnished to the usual room. In wiring the building for electric lights ceiling outlets should be left for drop cords to type cases.

As machines in the printing shop are motor driven, it is desirable to locate the presses so that wiring may be run to machines through concealed conduit. The advice of a skilled pressman should be obtained in locating the machines. If the equipment is to include linotype and monotype machines, provision should be made for the installation of these machines in rooms apart from the room to be used for the general course in printing.

Printing equipment for 8 to 12 pupils:

6 double cabinets or racks containing cases for job and news type, leads, slugs, rules, and spacing.

1 imposing stone, 32 by 60 inches.

1 paper cutter, 30 inches.

2 job presses, not less than 10 by 15 inches.

1 cylinder press, pony size.

1 proof press.

1 punch machine.

1 stitcher.

Adequate supplies, such as type, leads, slugs, rules, spaces, sticks, galleys, chases, leaders, quads, quoins, furniture, and stock of paper for productive job work.

Value of equipment (not including cylinder press), \$1,000 to \$10,000.

Annual cost of supplies per pupil, \$5 to \$10.

8. House Painting.

A room fitted up for instruction in house painting and wood finishing should be well ventilated, well lighted, and furnished with a stock room that is fireproof. It is necessary in wood finishing to have a room for varnishing that may be made dust proof, and which is supplied with good light, heat, and ventilation.

In the general shop cross sections of house partitions containing walls, ceiling, door and window openings should be constructed, on which to give demonstrations and practice work. As productive projects brought into this shop to be finished will necessarily occupy a considerable amount of floor space, a large floor area will be required, as well as additional room in which to store the finished articles.

For a class of 10 to 15 pupils, the school should provide:

10 to 15 sets of good brushes; to include one each of: 2-inch varnish, 3-inch varnish, 3-inch shellac, 2-inch stain, 3-inch stain, 2-inch paint, 3-inch paint, 4-inch paint, 4-inch flat duster, and 3 assorted sizes of sign writers' pencils.

10 to 15 easels for color and drawing work.

3 each of 6-foot and 8-foot step ladders.

2 each 16-foot and 18-foot extension ladders.

2 pairs ladder jacks.

6 pairs tilly trusses 9 feet.

1 lot of plank for scaffolding.

15 putty knives.

Cases with metal drawers should be provided as follows: 12 to hold 5 pounds each of dry or pigment color; 3 to hold 20 pounds each of same.

3 60-gallon metal tanks for oil, benzine, and turpentine.

2 drop cloths 24 by 36 feet.

3 drop cloths 4 feet 6 inches by 32 feet.

Adequate supplies of drawing paper, cardboard, paint brushes, charcoal, rest sticks, colors dry and in oil, oils, stains, varnish, and lead for practical work.

Value of equipment, \$400 to \$1,500.

Annual cost of supplies per pupil, \$5 to \$10.

9. Sheet Metal.

A room fitted up for a sheet-metal shop needs ample floor space. Projects made of sheet metal often require a large area in which to assemble the parts. As pattern drafting is an essential part of the work in the sheet-metal shop, large tables on which to develop and lay out patterns should be provided as a part of the equipment. Good light will also be necessary for this work.

For a class of 10 to 15 pupils, the equipment should include:

5 double drafting tables, tops 42 by 54 inches.

3 work tables, tops 48 by 96 inches.

1 beading machine.

1 burring machine.

1 bench plate.

1 brake, 3 feet.

1 brake, 8 feet.

1 crimping machine.

1 beak horn.

1 blow horn.

1 folder machine.

2 gas furnaces.

1 forming machine.

1 each hollow, round, straight mandrel.

1 square shears, 36 inches.

1 circle shears, 32 inches.

1 double seamer.

1 turning machine.

1 wiring machine.

1 bench punch and shear.

10 to 15 sets hand tools, and miscellaneous small tools.

Value of equipment, \$750 to \$2,000.

Annual cost of supplies per pupil, \$5 to \$15.

10. Plumbing.

In designing a room for plumbing, provision should be made for more than the average ceiling height. This is necessary in order to provide for the installation of plumbing systems in practice houses of at least two stories and basement. In some cases, schools have arranged for two floors of the building to be given to plumbing, and cut large openings in the floors through which to extend the rough work. In any case, it is necessary to provide 500 to 700 square feet of earth floor space for installing drainage systems in tile and cast iron pipe.

For a class of 10 to 15 pupils, the equipment should include:

3 metal topped tables, tops $\frac{1}{2}$ by 42 by 96 inches.

12 melting pots with gas burners (or plumbers' furnaces).

2 plumbers' gasoline torches.

1 skeleton of a building for practice work.

5 plumbers' kits.

6 each of 10-inch and 14-inch pipe wrenches.

3 each 18-inch and 24-inch chain tongs.

2 each 24-inch and 36-inch chain tongs.

Sets of stocks and dies, cutters, and supplies for lead work.

A supply of water, gas, and lead pipe, fittings and plumbing fixtures for practice work, including water-closets, urinals, lavatories, sinks, bath tubs, trap vents, and drain and drainage pipes.

Value of equipment, \$1,000 to \$2,500.

Annual cost of supplies per pupil, \$10 to \$15.

11. Pattern Making.

In general construction, a pattern-making shop is similar to a carpenter shop. Unless the school includes a foundry, a small furnace for melting white metal or brass should be available. This should be in a separate room with molding benches, sand, etc., for making test runs of certain patterns. A pattern shop usually requires large storage space for finished patterns. These should be in a separate room.

A typical equipment includes:

• Benches for 10 to 15 pupils.

1 band saw of not less than 30 inches.

1 8-inch jointer or bench planer.

1 saw table.

1 pattern maker's lathe.

1 trimmer.

3 wood-turning lathes.

1 glue pot, 2 quarts capacity.

1 set of flasks for molding.

2 sets molder's small tools.

} Unless otherwise available.

- 2 barrels of molding sand.
- 1 lot of white metal.
- 1 furnace for melting white metal.
- 10 to 15 sets of hand tools.
- A stock of white pine for patterns.
- Value of equipment, \$800 to \$2,000.
- Annual cost of supplies per pupil, \$5 to \$10.

12. Related Subjects.

As the vocational industrial shop differs from the usual manual training room, so the related science laboratory differs from the usual physics or chemistry laboratory. More floor space must be provided for demonstration in applied science. The course of study should require the use of full size apparatus, such as block and tackle, jack screws, derricks, gasoline engines, and commercial testing machines, as well as tables and apparatus for making analyses of paints, oils, fuels, electrical tests, etc., which may be related to the various industrial subjects.

(a) THE SCIENCE LABORATORY should be equipped with a projecting lantern, and should be located on the ground floor or provided with a freight elevator in order that testing equipment may be moved in and out of the room. In wiring the room for light and power service, a switchboard should be installed with a large capacity for experimental work with both high and low voltage.

Storage rooms and storage cases for the science equipment should be provided in the plans for the building. These can be constructed with temporary partitions and adjusted from time to time to meet the needs of the room.

(b) THE RELATED DRAWING ROOM need not differ greatly from the usual drawing room as planned for high schools. Dark rooms for printing and developing blue prints and the installation of blue printing machines, should be available. It is desirable to have separate rooms for mechanical and architectural drawing, as the models and instruction material will differ in the two types of instruction.

In addition to the usual drawing tables, storage facilities for blue prints should be liberally provided. In the factory type of construction, it will be possible to adjust the relative amount of floor space between shops, lecture rooms, and rooms for related subjects, as the school develops.

(c) THE LECTURE OR CLASS ROOM in vocational schools may be the usual class rooms fitted with either chairs or school desks, and located away from the noise of the shops.

13. The General School.

Whenever plans are being made for giving vocational training as a department or class in a general school, the architect should

incorporate in his plan the same provision for shops as have been outlined for a factory building.

14. Old Buildings, Factories, or Industrial Plants as Temporary Quarters.

Old buildings or industrial plants which may be used for vocational schools should at the best be regarded as temporary quarters, in which to develop vocational education in the community. Few buildings have been constructed in the past which may be adapted to the needs of the productive shop.

It is often desirable for the community to begin vocational schools in these buildings, in order that a new building may be more efficiently planned. As a rule, school authorities should not regard old buildings which have been abandoned or disused as fit quarters in which to establish vocational schools. Where such schools are established, it will often be necessary to enlarge rooms by combining two or three and removing the partitions. Quarters obtained in industrial plants should also be regarded as temporary, unless the plant furnishes opportunities for obtaining practical experience in the industrial subject for which the school is organized.

15. The Part-time School.

The conditions under which part-time pupils are instructed do not usually require special buildings. Although where this work is extensive, as in Milwaukee, a special building will in time result. The all-day trade school usually has all of the facilities for this instruction. It is impossible at this time to define in detail all of the varieties of part-time classes which may be organized under the provisions of the Federal act.

16. The Evening Industrial School.

Evening instruction can be given only in such subjects as will increase skill or knowledge in the occupation in which the worker is engaged as his daily employment, or as will lead to promotion or advancement in that work. The time available in an evening school is so short that it is impossible to teach a skilled trade to any one unless he is engaged in daily work affording him opportunity to apply the skill or knowledge gained in the evening school, or unless the daily employment gives an experience which will enable the worker, with the knowledge or skill acquired in an evening school, to secure promotion in that occupation. The work can be most effectively given when workers in similar or allied occupations are grouped together.

The all-day school is suitable for evening instruction if sufficient light is provided. Since much of the instruction in the shops is trade extension, the equipment must include commercial tools and machines.

VII. A FEW TYPE BUILDINGS.

At different points throughout this bulletin will be found illustrations showing the floor plans and elevations of a few of the buildings used in the United States for industrial and trade education. It was deemed advisable to present illustrations of the three different types of building discussed in the foregoing pages, the new building built for the purpose, the shop or factory adapted for the purpose, and the old school building remodeled. As there are pronounced variations in each type, a number of illustrations are given.

No attempt has been made to include all or any considerable number of the many excellent buildings which are to an increasing degree being used for industrial and trade education. A few have been selected for presentation solely from the point of view of their usefulness to illustrate the different types and variations of types of buildings used in the country.

In order that these illustrations may be of larger interest and helpfulness to those studying the problems of industrial school construction and equipment, this section of the bulletin gives a brief resumé of the main facts about each school presented.

1. THE WORCESTER BOYS' TRADE SCHOOL, WORCESTER, MASS.

HISTORY AND LOCATION.

The Worcester Boys' Trade School was established in February, 1910, with an enrollment of 52 boys. It is located one block from the Worcester City Hall on a tract containing 45,000 square feet. Adequate car service makes the institution accessible from all parts of the city and vicinity. Natural light and ventilation are not obscured or interfered with by adjacent buildings. The school is supported by public funds.

BUILDINGS.

Buildings especially designed for the purpose were erected to house the school. The left wing of the main structure, a recitation building of three floors and a basement, and a shop of three floors, was built in 1910. In 1913 the main building was constructed. The buildings are of brick, permanent brick and tile partitions, hardwood floors, and electric lighted. The main building contains the gymnasium, electrical and steam practice departments, two recitation rooms, administrative offices, library, drafting room, carpentry department, and paint shop. On the third floor is the printing department and assembly hall. Plans for future enlargement of the institution contemplate the erection of buildings as large again, equipped with all necessary machinery. The present value of the structures now in use, including heat and lighting plant, is given at \$146,657.62. Natural light and ventilation of buildings are ample.

Classrooms for related subjects join the shops. Other classrooms are apart from the shops, but all are in the same building. The estimate of floor space varies per pupil for the different departments, being: Machine shop, 100 feet; electrical, 110 feet; steam power plant, 175 feet; drafting room, 50 feet; printing, 152 feet; pattern making, 149 feet; cabinetmaking, 96 feet; carpentry, 130 feet; painting, 214 feet.

FIG. 1.—Worcester Boys' Trade School, Worcester, Mass. The exterior of this building presents a good type of factory construction. Simplicity and plenty of natural light are apparent in the design of the exterior.

EQUIPMENT AND COURSES.

Equipment is valued at \$61,099.28, apportioned as follows: Machine shop, \$32,270.31; carpenter shop, \$2,440.53; cabinet shop, \$3,830.51; pattern shop, \$7,414.01; paint shop, \$237.74; electrical department, \$6,284.27; drafting department, \$2,071.77; printing department, \$6,550.14.

The shop student capacity is: Machinist, 65; electrical, 20; steam power plant, 20; drafting, 44; printing, 15; pattern making, 24; cabinetmaking, 50; painting, 10; carpentry, 16. The school is able to take care of twice as many boys as the capacity of the shops indicate, because the classes are so arranged that it takes two weeks to complete the cycle of instruction. One-half the pupils are in the shop and one-half in school each week.

MISCELLANEOUS DATA.

There is a minimum age for entrance of 14 years. All courses require four years for completion, and there are 42 weeks in the

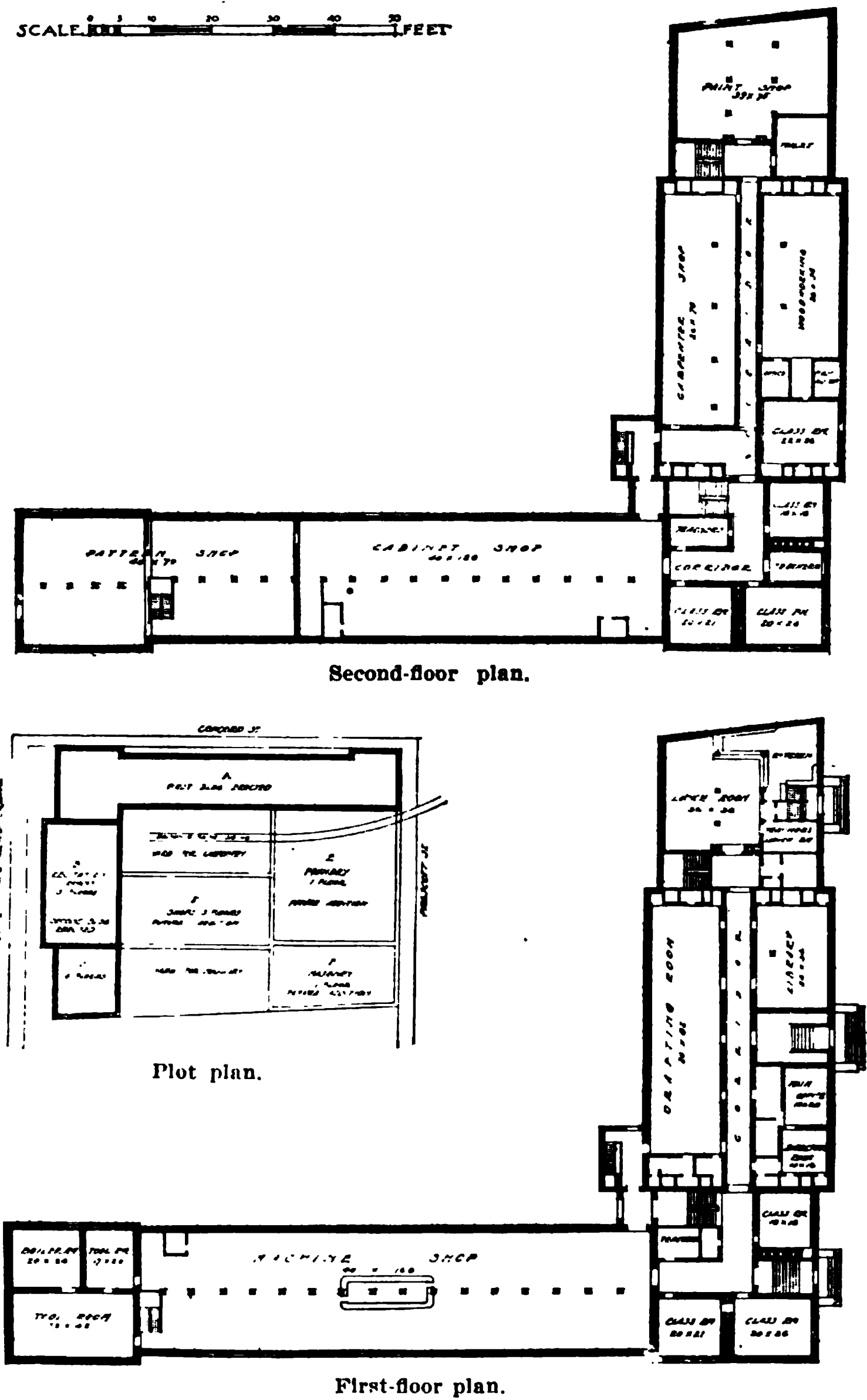


FIG. 2.—Floor plans of Worcester Boys' Trade School.

school year. No part-time instruction is given. There is an evening school which requires 52 sessions for all except the gas-engine course,

there being 35 sessions required for that. No extension work is conducted.

2. THE DAVID RANKEN, JR., SCHOOL OF MECHANICAL TRADES, ST. LOUIS, MO.

HISTORY AND LOCATION.

This institution was endowed in 1907 with an initial gift of \$1,500,000 by the philanthropist whose name it bears. A subsequent donation brought the total up to \$3,000,000.

The terms and conditions of the endowment as prescribed by the donor are that it "is to be used for training and fitting boys and men for the mechanical and manual trades and occupations * * * who shall be skilled in their respective trades and occupations and have such education as will best fit them to serve the community and the State in such occupations." The founder believed there was need of an institution to provide education in ordinary mechanical trades and to appreciate the dignity of labor. His idea was that public schools and other educational institutions had "not only failed to provide training in mechanical trades, but had tended to draw boys away from the consideration of them by the creation of a prejudice against manual labor. Boys who could have succeeded as mechanics were, in consequence, caused to engage in pursuits either already overcrowded or for which they had no aptitude." Mr. Ranken stipulated that the trades taught in the school created and maintained by his money should be those in which there is a demand for practical workmen in the community and the State.

The site was donated by the founder. It is 300 by 600 feet, or approximately 3 acres, located in a residential part of the city of St. Louis which is rapidly becoming industrial in character. It is not, and, by reason of streets on all sides, can not be overshadowed or crowded by adjacent buildings. There is thus an assured maximum of natural light and ventilation.

It is accessible by a good car service reaching all parts of the community. The plant at present covers about 30 per cent of the ground. The remainder is available, and ample for recreation purposes and future additions to the buildings.

BUILDINGS.

In 1909 the first of the buildings was completed. It is a three-story brick, especially designed for the purpose. Careful attention was paid in the plans to lighting, heating, and ventilation. Electric lighting is used throughout. It has brick partitions, and the flooring is karbolithic laid on cement, except in the shops, where wood block is used. The building was erected during a period when

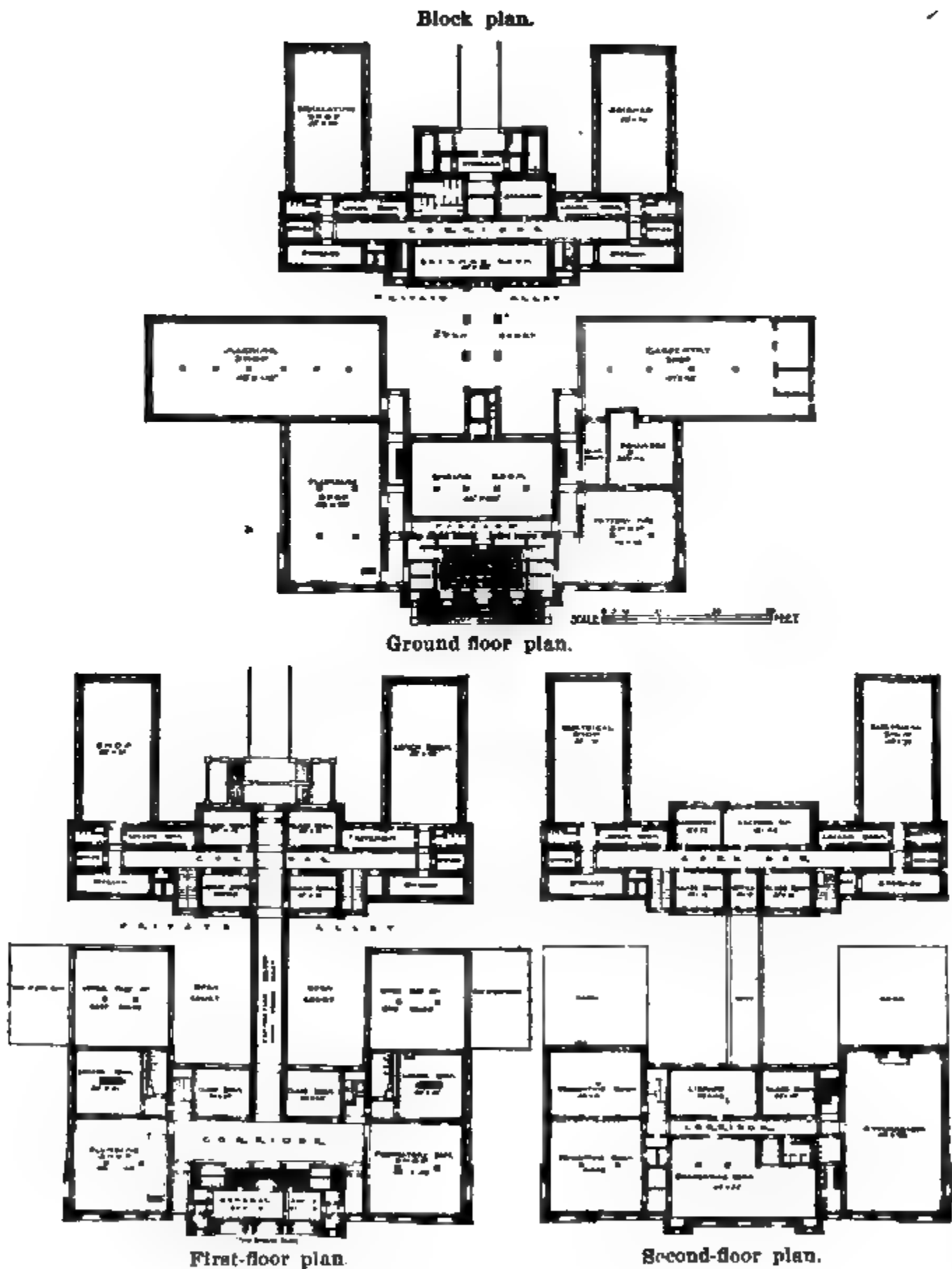


FIG. 8.—Floor plans of the David Ranken, Jr., School of Mechanical Trades, St. Louis, Mo.

material was cheap and wages lower than in recent years, and its total cost was \$170,000 and initial equipment valued at \$9,000.

This building faces Cook Avenue, and contains six shops, a drafting room, science room, library, classroom, and administrative offices.

The second building was completed in 1912, and was also especially designed for its purposes. It is of brick, with hollow tile partitions, karbolithic floors laid on cement, except in shops, these being of wood block. This structure is modern in all respects and well suited for its functions. The completion of this building brought the total value of buildings of the David Ranken, jr., School up to approximately \$500,000 as estimated in 1918.

EQUIPMENT AND COURSES.

The equipment for teaching trades was inventoried in April, 1918, as: Bricklaying, \$1,200; painting, \$1,000; electrical, \$9,000; preparatory, \$1,600; machine shop, \$30,000; plumbing, \$3,000; pattern shop, \$4,000; carpentry shop, \$7,500; science, \$3,500; total, \$60,800. The steam engineering class uses boiler and engine room equipment not included in the above figures.

There are three schools—day, evening, and day cooperative. The institution “aims to give the boy without experience training similar to that received by the apprentice; to the apprentice such instruction as will round out his shopwork, and to give to the journeyman information concerning his trade that is not given in his shop. It also aims to obtain the cooperation of manufacturers who acknowledge the limitations of shop instruction, and who will send their apprentices to the school to study the theory of their trade.” The institution is therefore intensely practical. The trades instruction is almost entirely individual, and pupils, except in stationary engineering, may enter at any time. The great majority of the pupils in the evening school are actively engaged in the trade, the theory or practice of which is taught in the school.

REQUIREMENTS FOR ADMISSION.

For admission, boys must be white, 15 years and over, who have completed the sixth grade of the public schools or its equivalent. In the day school, exception is made in favor of boys 14 years of age who have completed the work of the sixth grade or equivalent, are physically qualified for the work, and exhibit particular aptitudes for trade instruction. All applicants must be in good physical condition. Any candidate with trade experience, but who lacks the educational qualifications, may make up the latter in special classes formed by the school for preparatory instruction.

COOPERATION OF EMPLOYERS.

The cooperative classes were organized at the suggestion of the St. Louis branch of the National Metal Trades Association for the instruction of apprentices in the machinists' and pattern-making trades. The association, through its shop superintendents, provides complete instruction in the use of tools and machines, leaving the theoretical instruction to the school. The institution holds out a standing invitation to employers of apprentices to avail themselves of the work offered in the cooperative classes. A minimum of 16 years of age is required for admission. Employers pay \$15 per year tuition for each apprentice, and at the same time pay the regular wages for time spent in attendance at the school.

Associations of manufacturers, contractors, workmen, and men and boys who are employed by the day but attend evening classes have all shown considerable appreciation of the school. Employers whose apprentices are in the cooperative classes have expressed themselves as pleased with results, and the general attitude of the public toward the institution is that of cordial good will and respect for its work.

MISCELLANEOUS DATA.

A nominal tuition is charged in order to cause pupils to take the work seriously and appreciate the opportunity, as well as for the purpose of eliminating the undesirables with no definite purpose, who drift in and out of absolutely free schools without completing any course. Pupils are required to provide their own drawing instruments, paper, and incidental material. Tools and supplies in the shops are furnished by the school.

There were in March, 1918, a total of 302 graduates of the day school, regular trade courses, and 90 graduates of the part-time courses. The total enrollment for the day school was 1,402; part-time students, 312; evening students, 4,000.

The school year for day pupils covers a period of 46 weeks, divided into three terms. The evening-school year covers two terms of three weeks each, beginning in October and in January.

3. THE WILLIAMSON FREE SCHOOL OF MECHANICAL TRADES, WILLIAMSON SCHOOL, PA.

HISTORY AND LOCATION.

December 1, 1885, Isaiah U. Williamson founded the school which bears his name. On October 21, 1891, the institution, with an endowment of about \$2,000,000, became a reality and opened its doors for its first session. The endowment is its sole support. No fees of any sort are charged.

The declared purpose of the founder was to give to poor and deserving boys a good English education; to train them in habits of morality, economy, and industry; and to teach them trades. The school is distinctly vocational, and only for pupils who intend to follow for a livelihood the trades taught them there. No others will be admitted.

The institution is located at Williamson School Station on the central division of the Pennsylvania Railroad, about 16 miles from the Broad Street Station in Philadelphia. The Media Short Line elec-

FIG. 4.—Machine shop and pattern-making building, Williamson Free School of Mechanical Trades, Williamson School, Pa.

tric cars from the Sixty-ninth Street Terminal, Philadelphia, also reach the property. The school owns a tract of 230 acres of land, that part not in use for campus and buildings being devoted to agriculture and the teaching of agriculture. The site is a beautiful one and well suited to its purpose.

BUILDINGS.

A few of the buildings were acquired with the land. The rest have been constructed especially for the purposes for which they are being used, and most of them were erected by student labor, giving practical instruction to the students of the various trades

involved. The buildings are of brick, concrete, and wood; floorings are of wood and concrete, and in the shops the partitions are of yellow pine placed as needs arise. Owing to the amount of land possessed by the school, the campus has been so arranged that each building has a maximum of light, air, and distance from other buildings. In the main the buildings have been carefully designed for their purpose, and have met the requirements satisfactorily. Some of the buildings erected by the students are somewhat pretentious, of pleasing architecture, and well built. Electricity is used for lighting, and there is a central power and steam-heating plant.



FIG. 5.—Agricultural Building, Williamson Free School of Mechanical Trades.

EQUIPMENT AND COURSES.

In the shops, approximately 163 square feet of floor space, including locker and wash room, is figured per pupil. For academic work approximately 18 square feet of floor space per pupil is figured. In the drawing room 45 square feet per pupil is allotted—this, however, including supply room and blue-print room. Classrooms are in the shops for shop subjects, and apart from the shops for cultural and related subjects.

The trades taught are: Agriculture, including a practical and scientific course in dairying, horticulture, and general farming; carpentry, bricklaying, including range, furnace, and boiler setting, etc.; the machine trade in its usual details; operating engineering,

including care of steam and electrical appliances, steam fitting, etc.; and pattern making. The shops are well equipped for trade teaching.

The value of this equipment is given as: Machinist's trade, \$26,000; carpentry, \$8,320; pattern-making trade, \$12,870; bricklaying, \$3,100; operating engineering, \$27,690; scientific agriculture, \$27,300; total, \$116,280. Operating engineering students receive their practical training in the steam and electrical plant of the institution, which provides all heat, light, and power needed. Each scholar takes but one of the trades mentioned.

REQUIREMENTS FOR ADMISSION.

Graduates of the Williamson School have a reputation for thoroughness, and as high as 98 per cent of the members of a graduating class have immediately started as journeymen at the trades taught them. Admissions are made in April of each year, and first preference is given to boys from Philadelphia, or Bucks, Montgomery, and Delaware Counties, Pa.; second to those from elsewhere in the State; third to those from New Jersey; and finally to applicants born elsewhere in the United States. None but natives of the United States are eligible for admission. Candidates must be not less than 16 nor more than 18 years of age, healthy, able-bodied, possessed of natural aptitude and liking for mechanical or agricultural work. They must have sufficient education to enter readily upon the school work.

Applications for admission considerably exceed capacity and there is a waiting list, for which boys of not less than 15 years of age and upward and who will not be more than 18 at the next admission period may qualify.

STUDENTS ARE INDENTURED.

A preliminary trial is given applicants, and those who are found satisfactory are bound to the trustees as indentured apprentices for a term of three years. This indenture may be canceled by the trustees at any time for incompetency, bad conduct, or reasons compelling the conclusion that a boy is undesirable for future support and education. The scholars, by the indenture, are obligated to conform to all regulations and restrictions of the board of trustees or their representatives; and all right of claim to control them during the period they remain at the school is lodged with the trustees.

MISCELLANEOUS DATA.

The school can accommodate about 250 students. Their life is made to conform as far as possible to good family standards in so far as living quarters are concerned. The boys are divided into

families of 24, each having its matron and its own distinct home or cottage, cared for by its occupants. These homes contain no kitchens, dining rooms, or laundries. These, as well as the dining hall, are located in other buildings. Special attention is paid to the moral training of the students. The school is nonsectarian, but each student is required on entrance to designate his denominational preference and thereafter to attend service regularly at its nearest place of worship. A four weeks' vacation in summer and short vacations at Easter, Fourth of July, Thanksgiving, and Christmas are given to students deserving them.

4. THE LATHROP SCHOOL OF MECHANICAL TRADES, KANSAS CITY, MO.

HISTORY AND LOCATION.

The Lathrop School of Mechanical Trades—a part of the public-school system of Kansas City, Mo.—was organized in 1911 as a boys' industrial school, and continued as such until 1916, when it was reorganized into a trade school. It was housed first in an old brick school building erected in 1900. The site is well located, is accessible by car lines from all parts of the city, has ample natural light and ventilation, and is not overshadowed or crowded by adjacent buildings. The ground is 277 by 168 feet, and the buildings cover about 75 per cent of this area.

BUILDINGS.

In addition to the old main building, a new shop building of modern factory type is being constructed in units. The first of these was completed in 1916 and the second in 1917. Further extensions will be erected as needed. Both are constructed of brick, with permanent plastered partitions. The total value of buildings is inventoried at \$91,000, not including value of the site.

EQUIPMENT AND COURSES.

The equipment is valued at: Cabinetmaking, \$3,300; electricity, \$1,000; plumbing, \$350; painting, \$300; printing, \$3,500; carpentry, \$200; sheet metal, \$600; total, \$9,250.

The minimum age requirement for entrance is 14 years for all courses, and each trade requires 2 years of 40 weeks each.

In the evening school electricity, sign writing, cabinetmaking, printing, and sheet-metal working are taught. Two terms of 35 nights each are required per year. Part-time school instruction is given in printing.

MISCELLANEOUS DATA.

The capacity of the school is given as follows in the various courses: Electricity, 24; carpentry, 24; plumbing, 12; painting, 24;

FIG. 7 Bird's-eye view of the William Hood Dunwoody Industrial Institute, Minneapolis, Minn

sheet-metal working, 24; total, 162. Enrollment March 1, 1918, was reported as: Plumbing, 5; sheet-metal working, 8; advanced electricity, 24; cabinetmaking, 14; wood turning, 16; printing, 10; painting, 15; elementary electricity, 15; carpentry, 14; and 4 men in the evening printing class; total, 125 pupils.

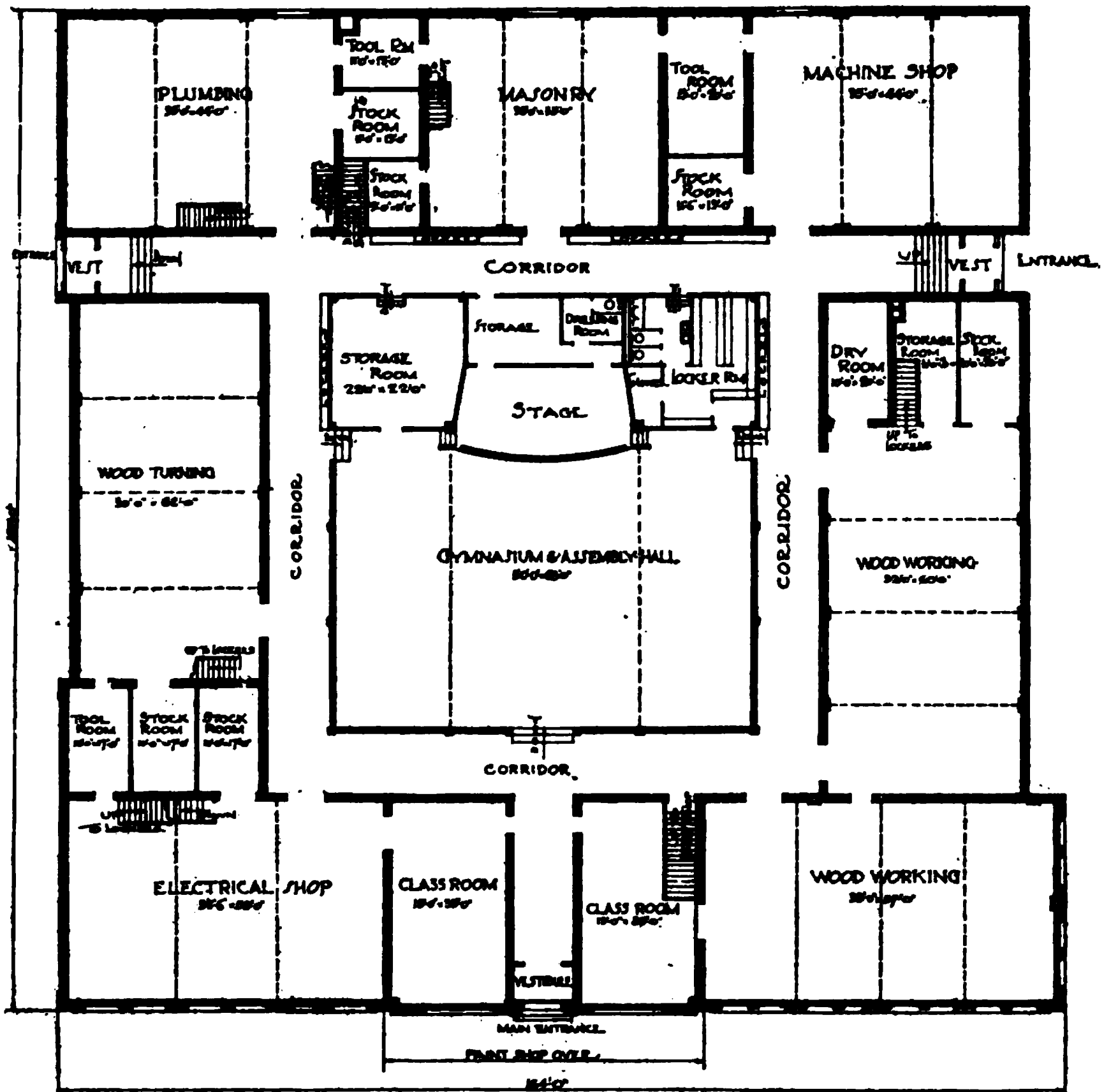


FIG. 6.—Floor plan, shop building, Lathrop School of Mechanical Trades, Kansas City, Mo., showing as a type plans of an old main building of brick erected in 1900 for regular graded school work, remodeled in 1911 as a boys' industrial and trade school, to which new shop buildings of modern factory type are being added in units, the first two being completed in 1916 and 1917, respectively.

5. THE WILLIAM HOOD DUNWOODY INDUSTRIAL INSTITUTE, MINNEAPOLIS, MINN.

HISTORY AND LOCATION.

By the will of Mr. William Hood Dunwoody, a wealthy flour manufacturer, who died February 8, 1914, approximately \$3,000,000 was devised for the purpose of establishing an industrial school which should be free, without restriction of race or color, to all residents of the State of Minnesota and the city of Minneapolis. Twelve

trustees were designated by the will to start the work of carrying out the desire of the donor. They met and organized themselves into

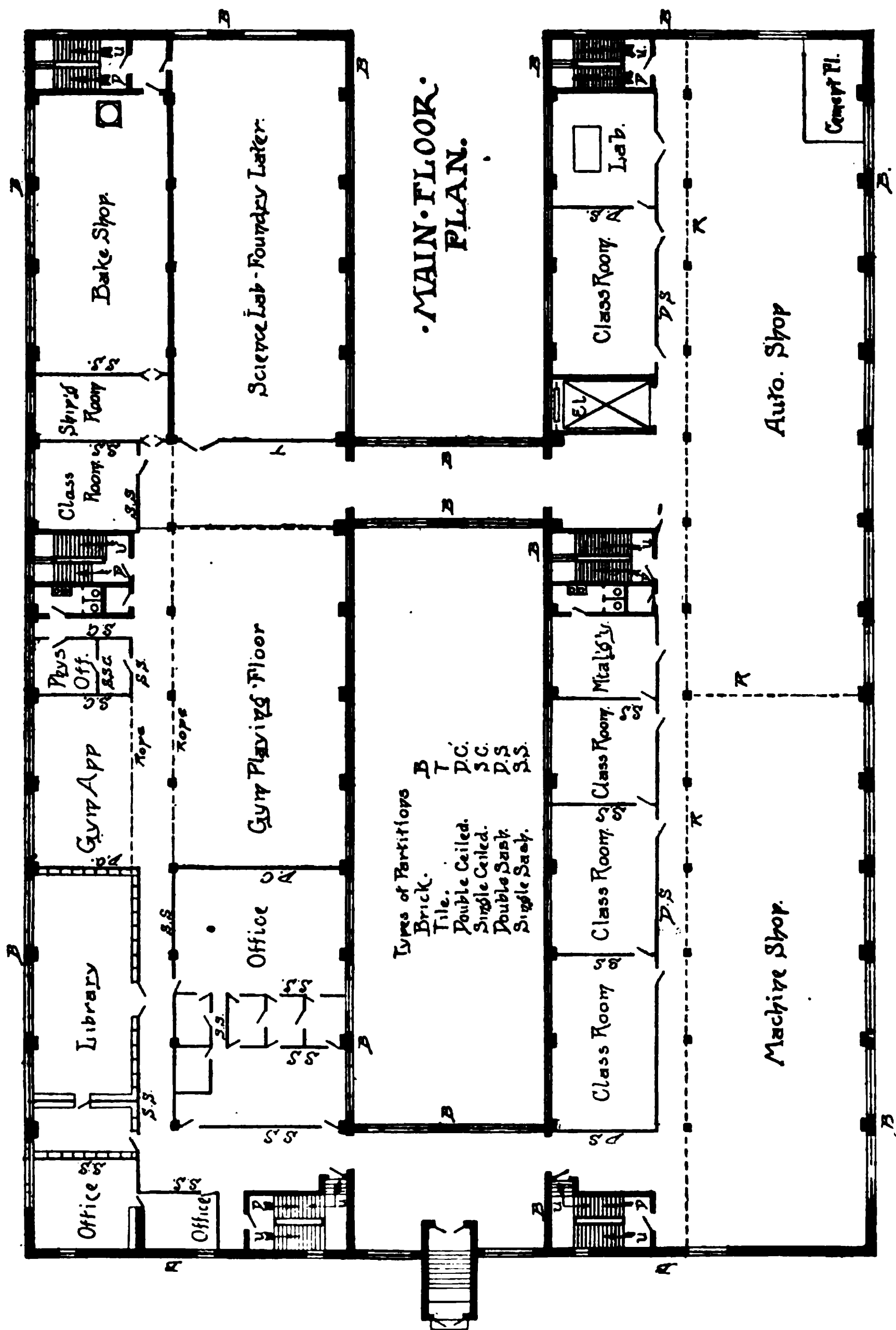


FIG. 8.--Main-floor plan of the William Hood Dunwoody Industrial Institute, Minneapolis, Minn.

a corporation. The school opened in December, 1914, with a registration of 80 students in four trades. The quarters occupied were

temporary. In 1915 Mrs. Dunwoody died, and by her will left an additional \$2,000,000 to the school, thus bringing the endowment total to \$5,000,000.

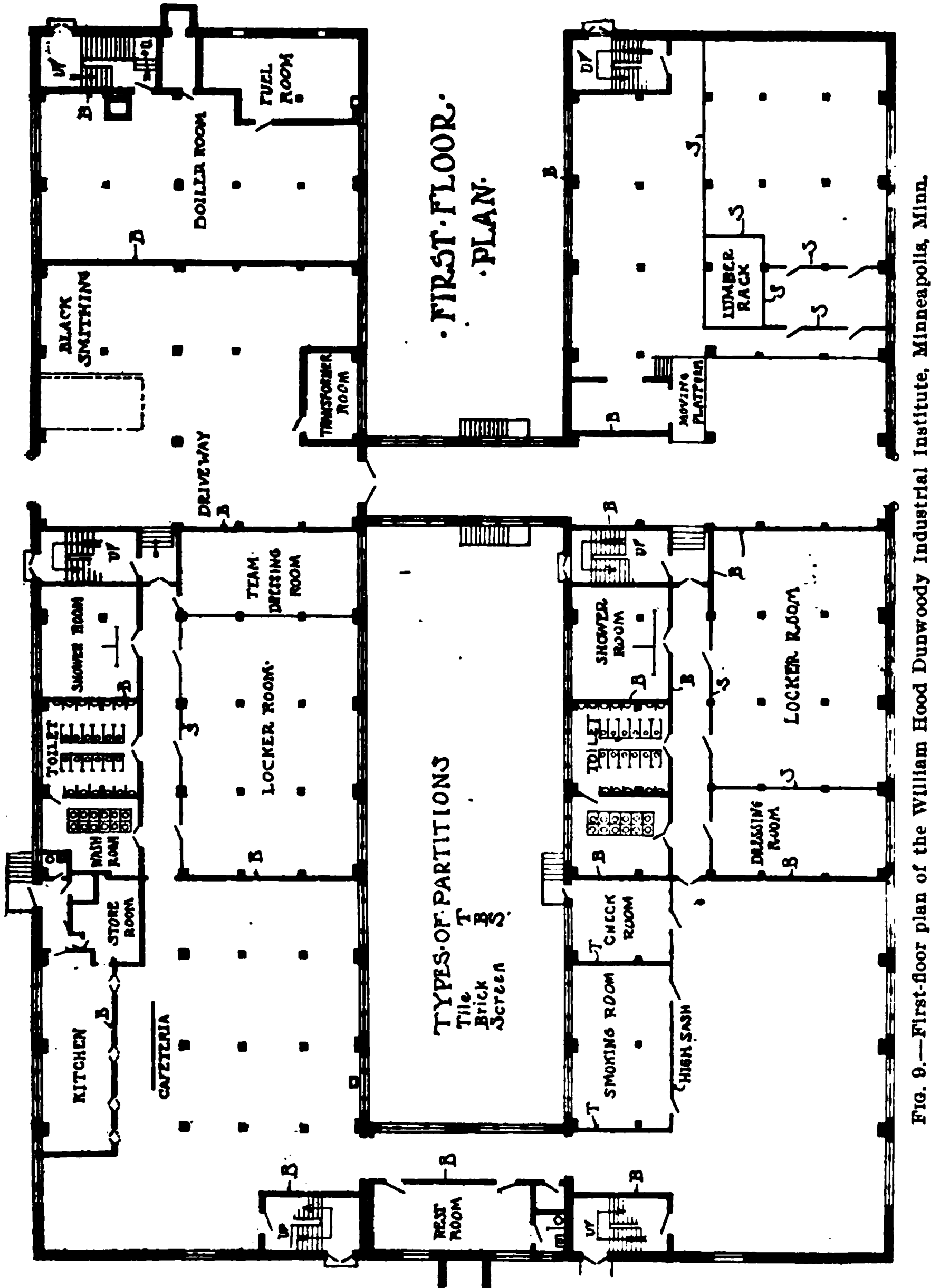


Fig. 9.—First-floor plan of the William Hood Dunwoody Industrial Institute, Minneapolis, Minn.

The trustees bought a 15-acre tract fronting on the parade grounds, in Minneapolis, upon which to construct the buildings and plant of

the new institution, which it was planned to make as near ideal as possible. The site conforms to the ideal. It is sufficiently large for

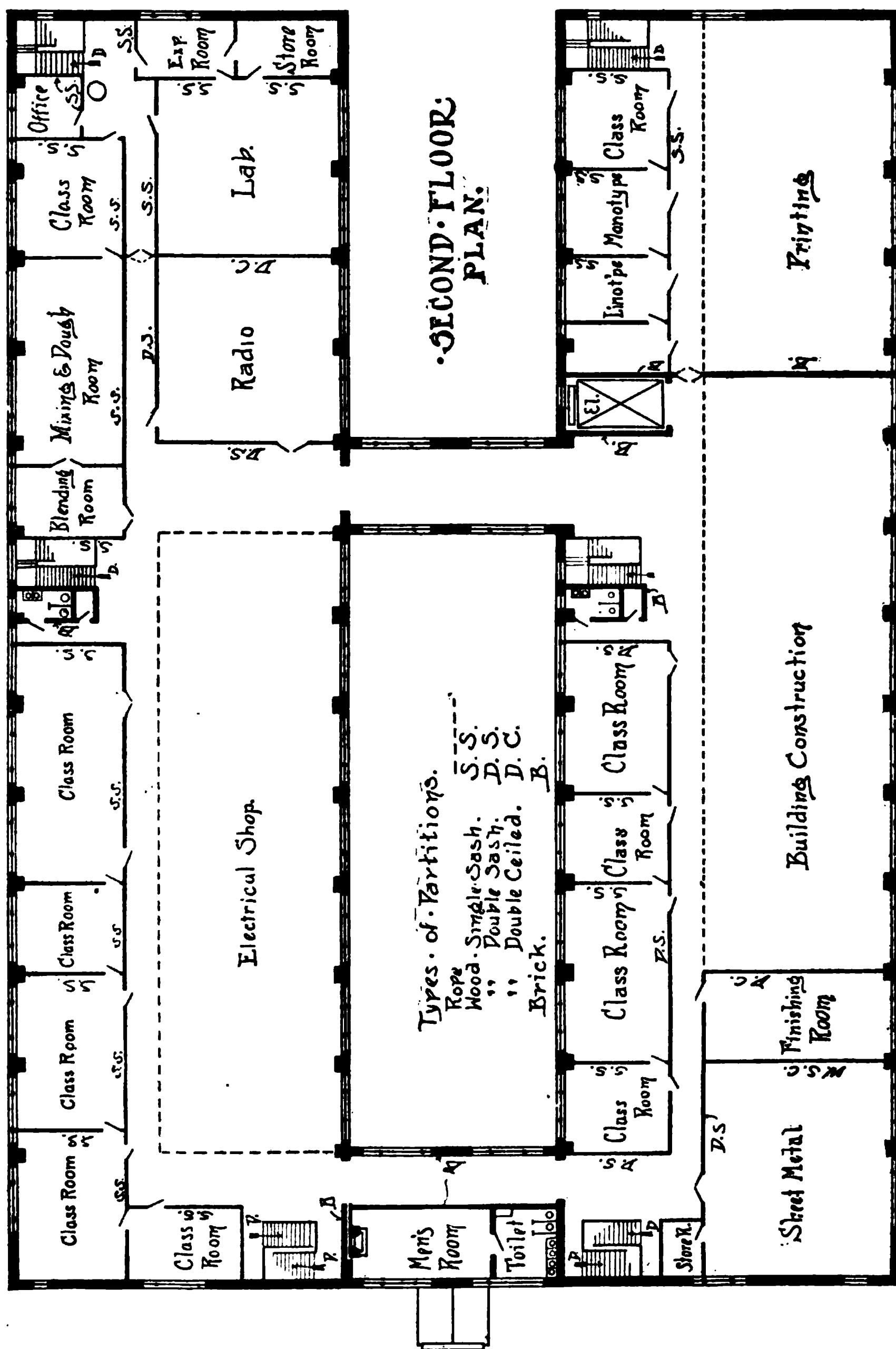


FIG. 10.—Second-floor plan of the William Flood Dunwoody Industrial Institute, Minneapolis, Minn.

present and future needs, located centrally, accessible to good street car service, and in a good neighborhood. It is in close proximity to

a public playground, and there is no possibility of the maximum of natural light and ventilation being interfered with.

When work began in December, 1914, there were 80 students and three trades or occupations taught. In January, 1915, the number of trades was increased to seven and the enrollment to 175. The present enrollment is in excess of 650 and the capacity 1,350, with lists of subjects taught as given below.

In September, 1915, the day school enrollment was increased to 250; and in October a night school of approximately 1,500 men was started. Dull season, part-time, and extension classes were started in the winter of 1915-16. Recruiting men in the Enlisted Reserve and war training began at Dunwoody in April, 1917. The school moved into its new quarters August 1, 1917.

All the regular peace-time activities of the school are continuing on approximately the same basis as before the war; all war work has been taken on in addition. The war work includes training of enlisted men in the Navy and Army for trade, and the mechanical occupations. It also includes the training of conscripted men in both day and evening school work.

BUILDINGS.

The new, especially designed buildings of the institute were completed in 1917 and are now occupied and in use. There are two units of reinforced concrete with brick facings, each 75 feet wide by 285 feet long, two stories high, with full basement. A total of 125,000 square feet of floor space is thus obtained, equivalent to a six-story building 75 feet wide and 285 feet long. Partitions are of wood and glass, temporarily placed as necessities require; fire-proof paint is used and the structures are made fireproof. Creosoted paving blocks are used as flooring. There are 27 classrooms, in which over 800 students can be given instruction. The classrooms are used for recitation and study purposes. The two parallel buildings are connected by two passageways on each floor, one at the front of the buildings and one at approximately the center. Future plans for expansion call for four more shop units, an auditorium, administration building, gymnasium, and power house. A set of sketches has been made for the complete plan of 10 buildings and athletic field, equipment for them to be provided in accordance with the industrial demands of the State.

EQUIPMENT AND COURSES.

Present equipment is valued at: Automobile department, \$10,000; baking and laboratory, \$30,000; aeroplane department, \$10,500; machine shop, \$30,000; power laboratory, \$15,000; woodworking department, \$10,000; total, \$141,500. In addition, special equipment has

been furnished by the United States War Department and the Bureau of Navigation to supplement apparatus of the institute in teaching electrical subjects, aviation, and Liberty motor subjects.

The day courses offered by the school are: Automobile work, baking, building construction, drawing and design, electricity, gas manufacturing, heat treatment, machine-shop work, plumbing, printing, radio work, sheet-metal trade, slide rule, steam fitting, telephony, welding, aviation motors, cooking, carpenters, coppersmiths, metal workers, blacksmiths, vulcanizing, pilots, quartermasters, machinists' mates, and Liberty motor ignition for the aviation section of the Army.

Evening courses are offered in: Automobile repair and construction, building construction (including carpentry, mill-room work, building foreman, cost estimating, and concrete construction), electricity (general), gas manufacture, heat treatment, plumbing, printing (composition, press work, and linotype work), sheet metal, slide rule, steam fitting, and telephony. These courses are divided into short units of 14 to 30 lessons each.

Evening courses running through the entire evening-school term of 50 lessons are: Baking, drawing and design, building-construction drafting, sheet-metal drafting, interior decorating, machine drafting and design, machine-shop subjects, radio operation, welding.

Evening-school courses are arranged on a basis of two hours per night, two nights per week. Shop courses are arranged four hours per night, one night per week. The length of the evening-school season is 25 weeks, or a total of 100 hours. The units in practically all classes are arranged to cover a period of from two to three years. A certificate is issued upon the completion of any unit; a diploma is issued upon the completion of all units in a course.

6. BOYS' TECHNICAL HIGH SCHOOL, MILWAUKEE, WIS.

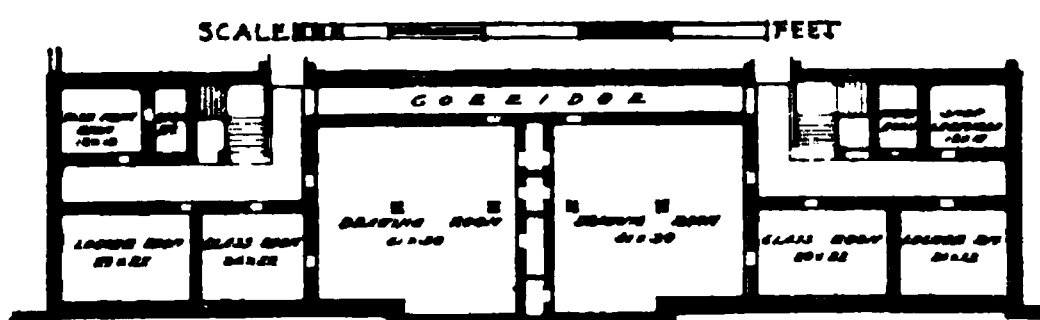
HISTORY AND LOCATION.

In January, 1906, some philanthropic citizens interested in vocational education founded the Milwaukee School of Trades. The institution, by act of the Wisconsin Legislature, was taken in and became a part of the public-school system of the city of Milwaukee July 1, 1907, and on May 1, 1917, the name was changed to "The Boys' Technical High School."

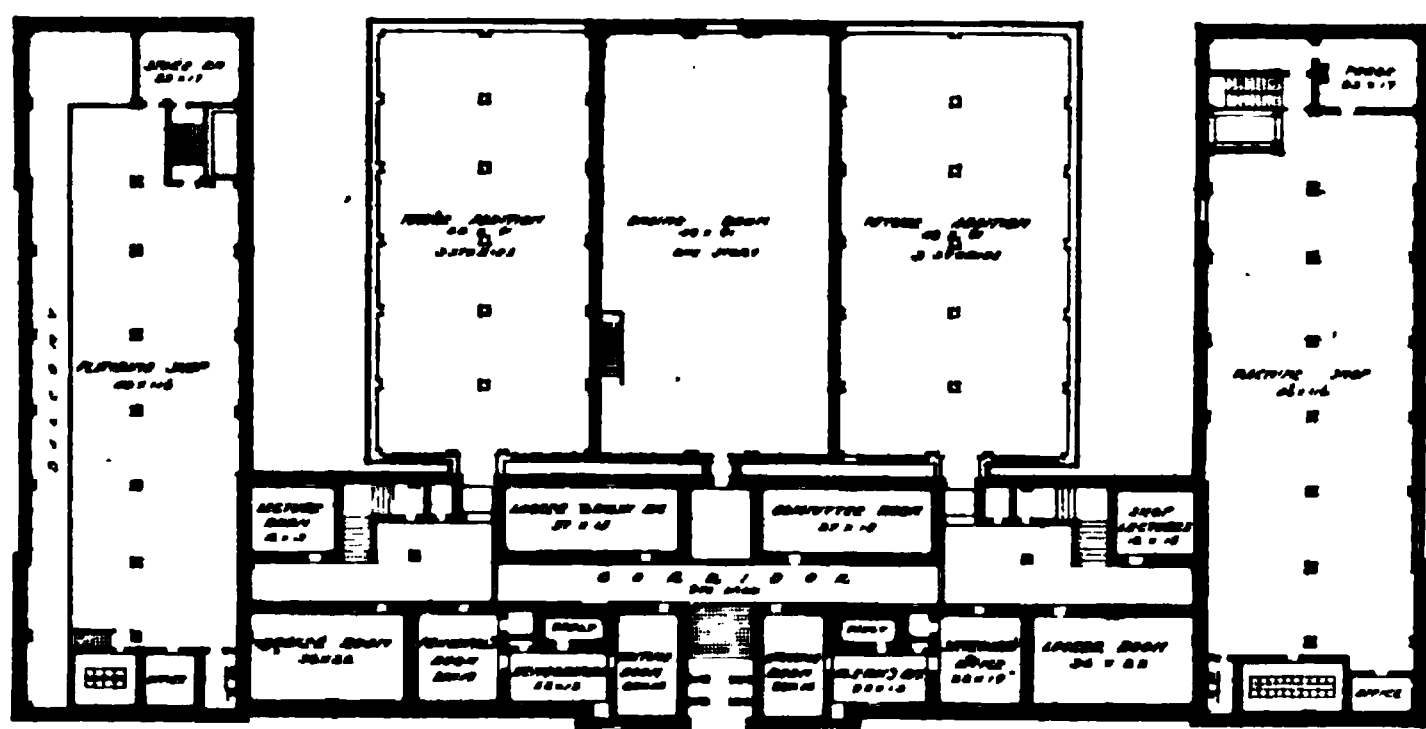
The site is centrally located in a district partly residential. It is 314 by 158 feet, and so situated that the natural light and ventilation are not obstructed, overshadowed, or interfered with by adjacent buildings. It is near the manufacturing center of the city, and is accessible by eight car lines from different parts of the community, and the general environment is good.

BUILDINGS.

The buildings occupied were erected for the purpose of a technical high and trade school in 1911-12. In 1915 the administration building was put up, and in 1917-18 the new west wing was constructed. The buildings are of reinforced concrete, faced with brick, and with hollow-tile partitions; the flooring, except in corridors, is of wood, and the buildings are lighted by electricity. Calculation of floor space is made on a basis of equipment. Contemplated expansion is designed to afford quarters to house the printing department and equipment, as well as the automobile department and its equipment. A new "East-wing" building is also being planned. The value of buildings is given as \$300,000.



Central part of third-floor plan.



First-floor plan.

FIG. 11.—Plans of Boys' Technical High School, Milwaukee, Wis.

EQUIPMENT AND COURSES.

Equipment is inventoried as follows: Machine and tool-making, \$50,000; for the pattern-making trade, \$8,000; electricians' trade, \$6,500; telegraphy, \$550; carpentry and cabinet-making trade, \$9,600; plumbing and gas-fitting trade, \$8,000; mechanical-drafting trade, \$1,500; architectural drafting, \$1,500; total, \$85,650.

The minimum age requirement is 16 years. Tuition is free to residents of Milwaukee under 20 years of age, except that a breakage fee of \$5 is required as a deposit. Nonresident students pay \$4 tuition per month, as do resident pupils over 20 years of age. The "technical-high" course requires six years, and the trade courses

two years each to complete, with an average of eight hours per day for each student. No extension work is given.

The courses consist of preparation for the following trades: Machines and tool making, pattern making, electrician, telegraphy, carpentry, cabinet making, plumbing and gas fitting, mechanical drafting, and architectural drafting.

The day sessions open in September and close in June. Evening instruction is given three times a week from October 1 to May 1 in all of the above-mentioned subjects. When 24 regular students whose individual programs permit of it sign a petition requesting a subject regularly provided in other Milwaukee high schools, that subject may be offered in the technical high school. Mechanical and free-hand drawing are taught in connection with all shop courses, and at all times each student's program shall include at least one shop course. Persons desiring to obtain a trade diploma in less than four years, work full 8 hours per day, 40 hours per week.

MISCELLANEOUS DATA.

The enrollment of pupils in 1918 was: Day classes, 172; night classes, 244. The management states that by employing additional instructors and using the shops to full capacity 470 pupils could be accommodated in day work and the same number for the night classes.

The school does not claim to turn out journeymen mechanics. Its aim is to instruct students thoroughly in as short a time as possible in all the fundamental principles and in practice of the trade in question. In this way the pupils upon graduation possess ability and confidence and are of immediate practical value to their employers and receive a fair wage at once.

7. THE NEW BEDFORD VOCATIONAL SCHOOL, NEW BEDFORD, MASS.

HISTORY AND LOCATION.

The New Bedford Vocational School is part of the Massachusetts public-school system. It was first opened in 1908, and has proved a very successful venture in practical education.

The site is 166 by 170 feet, located in an industrial district in the center of the city. Natural light and ventilation are not obstructed by adjacent buildings. The site was chosen on account of its accessibility by car lines and of its situation in an industrial district.

BUILDINGS.

The type of the main building is an old-frame factory building, rented in 1910. Some additions have been made to the plant since the building was taken over; a two-story frame building to house

the gas producer, a two-story addition 20 by 24 feet for the power plant, and in 1915 a three-story addition for tool and locker rooms for machine and carpentry departments. Floorings are of wood and concrete. The building has been converted to the present use so that it is serviceable, even if lacking in many respects. It is lighted by electricity. Classrooms are apart from the shops. Floor space per pupil has not been calculated, owing to the makeshift character of buildings.

FIG. 12.—New Bedford Vocational School, showing as a type an old frame factory building, rented by the city for the purpose since 1910, and still used as the main building to which buildings for housing the gas producer, power plant, and tool and locker rooms have been added. Building was chosen on account of its accessibility to car lines and situation in an industrial district

EQUIPMENT AND COURSES.

The value of equipment of the institution is given as follows: Machine shop, \$19,000; carpenter shop, \$3,000; power departments, \$11,000; electric department, \$4,000; homemaking department, \$5,000; total, \$42,000.

Capacity of school is given as follows: Machinery pupils, 36; carpentry, 45; electrical, 36; steam engineering, 20; homemaking, 45; a total of 182 pupils.

Number of pupils March 1, 1918, were: Machinery, day class, 31, night, 24; carpentry, day, 8, night, 12; electrical, day, 32, night 50;

steam power, day, 10, night, 32; homemaking, day, 32, night, 502; total, day students, 113, night, 620. There are 81 pupils in the part-time homemaking course.

Painting and decorating are to be added in the near future to the day courses. Evening classes for women are being conducted in seven sections of the city, and this extension work is scheduled for amplification.

The steam-power course is three years, as is the "homemaking" course. Machinery, carpentry, and electricity require four years each. There are 40 weeks in the school year, and forty courses are

FIG. 13.—Addition to power department, New Bedford Vocational School, built by boys, 1914.

required for machinists, carpentry, steam engineering, sheet-metal drafting, mechanical drawing, machinery, mathematics, carpentry, shop drawing, sewing, cooking, and millinery.

3. THE BAYONNE VOCATIONAL SCHOOL, BAYONNE, N. J.

HISTORY AND LOCATION.

The Bayonne Vocational School was organized September, 1911, by the board of education of the city of Bayonne. It is a public school, half the cost of support being paid by the municipality, the other half by the State. The location of the school is accessible all parts of the community.

The function of the school is to train boys to enter the industries of the community with some definite preparation for earning a living. It does not aim to turn out journeyman mechanics, but to ascertain what trade a boy is best fitted to follow, and then to give him such a foundation as will fit him to enter that trade as a superior apprentice.

BUILDINGS.

The main building of the school plant was erected about 1875 as a Y. M. C. A. structure. It was remodeled for a high school about 1908, and again remodeled in 1911-12 for occupancy and use as a vocational trade school. It is a three-story brick, with brick partitions. There is a frame annex of two stories, built for a high school, and in 1917 a one-story concrete base and maple floored extension to the mechanical shop was constructed. This building is 30 by 60 feet, and brings the total machine shop area to 3,600 square feet. Classrooms are apart from the shops. The total value of buildings is given as \$23,000.

EQUIPMENT AND COURSES.

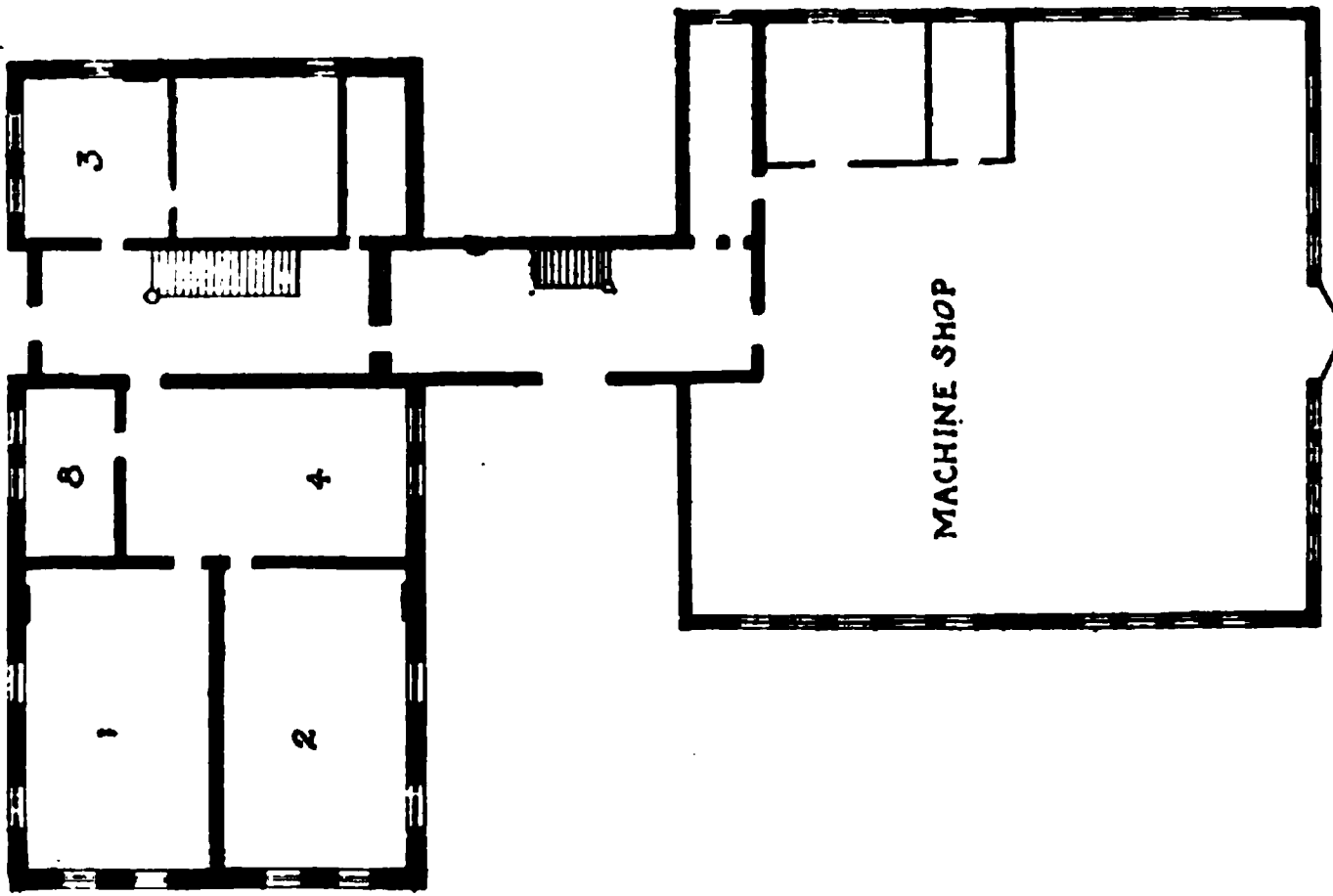
The value of equipment totals \$35,000 apportioned as follows: Machine shops, \$28,000; woodworking, \$2,000; electric wiring, \$2,500; printing, \$1,700; mechanical and academic drawing, \$700.

The capacity of the machine shop is for 40 students at one time; woodworking, 24; electric wiring, 24; printing, 24; and mechanical drawing, 24.

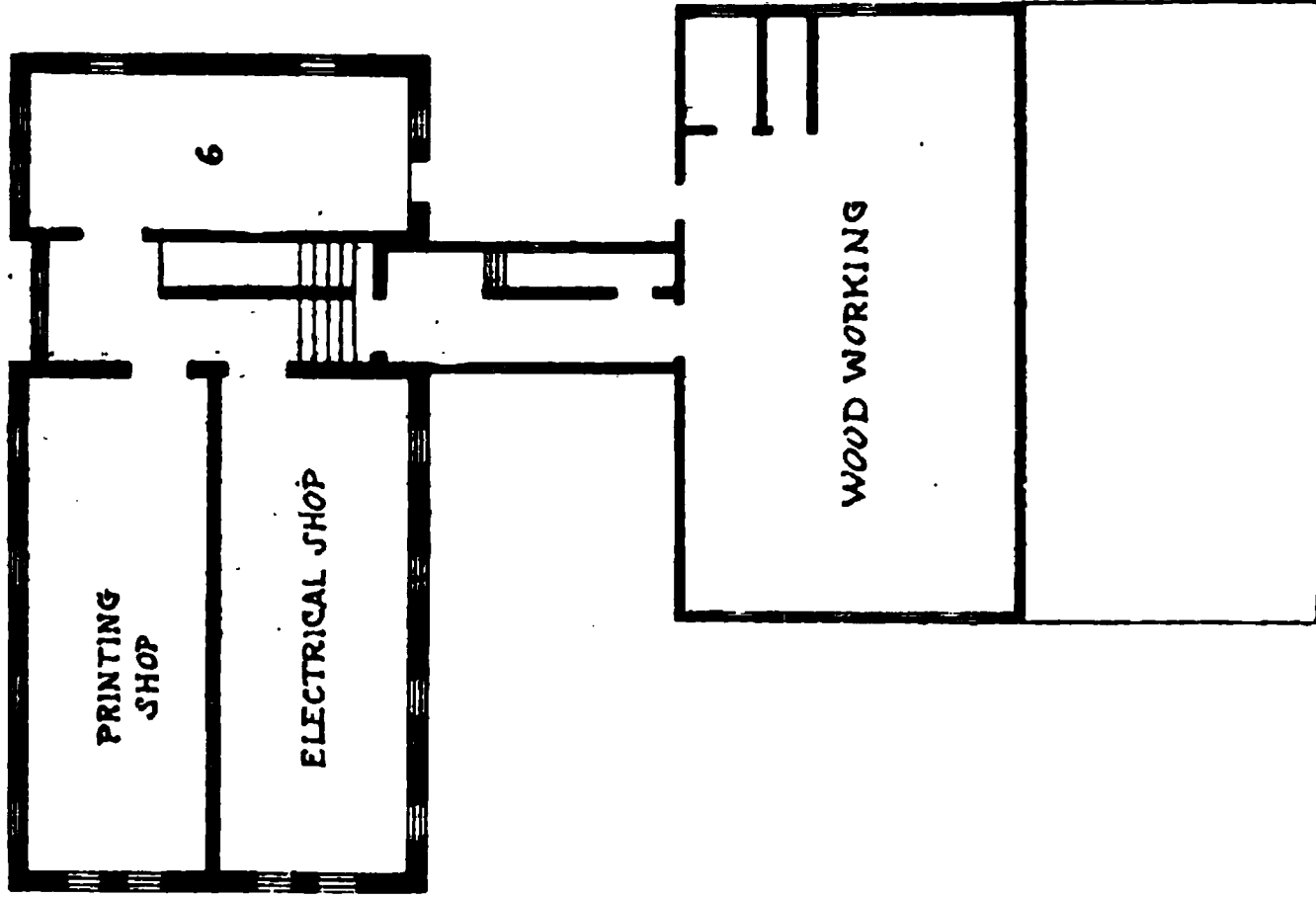
The daily program requires three hours of shop work, two hours of academic work (arithmetic, history, English, etc.), and one hour of mechanical drawing, making a school day of six hours.

Employers of Bayonne make frequent calls upon the institution for boys to enter their industries, and the number of calls has been greater than the school has been able to supply. The school has graduated 69 boys, over 90 per cent of whom are engaged in the trades for which they were trained.

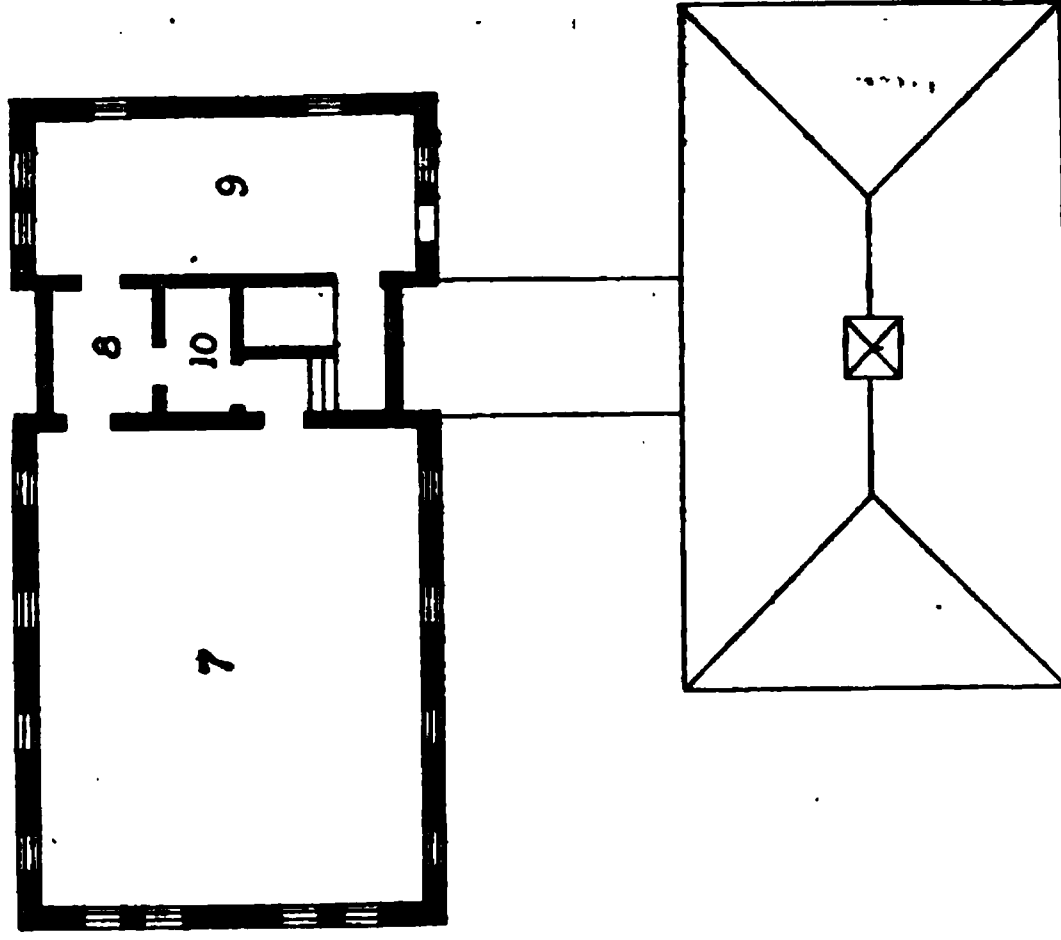
The minimum age for entrance is 14 years. A boy who has completed the eight grades in the elementary schools can graduate from the vocational school in two years; otherwise three years is required. Special academic work is provided for pupils who are not graduates of the elementary schools. There are 40 weeks in the school year for the day school, and a minimum term of 64 nights per year in the evening school, in which instruction in machine-shop work, pattern making, carpentry, electric wiring, and mechanical drawing is provided. No extension work is given. The school has enrolled over 900 pupils in the day courses. In the evening schools over 1,000 men have received technical instruction definitely related to their daily occupations.



·GROUND-FLOOR-PLAN·



·SECOND-FLOOR-PLAN·



·THIRD-FLOOR-PLAN·

FIG. 14.—Floor plans of the Bayonne Vocational School, Bayonne, N. J.

Shop instruction is individual as far as possible, thus permitting each pupil to progress as rapidly as he is capable of doing. Graduation is based upon proficiency in the shop, rather than the academic course.

9. WENTWORTH INSTITUTE, BOSTON, MASS.

GENERAL PLAN.

The buildings of Wentworth Institute which have already been erected (those shown in fig. 15, excepting the power plant in the rear of them) form merely a facade group of the great system of buildings which the directors have in mind for the future. It is hoped to build back over the grounds to the rear a plant which shall have, at its smallest, the size and arrangement indicated in figure 16.

The conditions which will control this development are the needs of the youth and of the industries of the community, with the em-

FIG. 15.—The building at Wentworth Institute, Boston, Mass.

phasis in one decade on one kind of work and on another in the next, and the introduction of new trades or the revision of old ones by new progress in methods. The approach from the parkway opposite will be kept impressive, and the administration buildings will always be conveniently located near the center of the group.

FLEXIBILITY OF PLAN FOR BUILDINGS.

To meet these conditions of development the plan for buildings has had as its first requirement flexibility. This flexibility was gained by adopting a standard building "*unit*" which may be repeated again and again in various locations upon the grounds without sacrificing symmetry, convenience of arrangement, or of connection between buildings.

A great variety of types of buildings was carefully studied. The advantages and disadvantages of each were considered. Finally, there was adopted a three-and-one-half-story and basement building, 48 feet wide by 144 feet long, divided into nine equal bays of 16 feet each. The width of the building is equal to the length of

three bays. The flexibility of the scheme results not only from the previous knowledge of the size of the units to be erected in any relation to any buildings already erected, so that a unit or two can be omitted and building proceed at a distance, if necessary, but it results mainly from the dimensions themselves, for the width being one-third of the nine-bay length permits a development into a T-shaped building by adding a standard unit or a double unit as a wing in the center of the rear, or it permits a U-shaped building to be developed by extending wings of single or double units at the

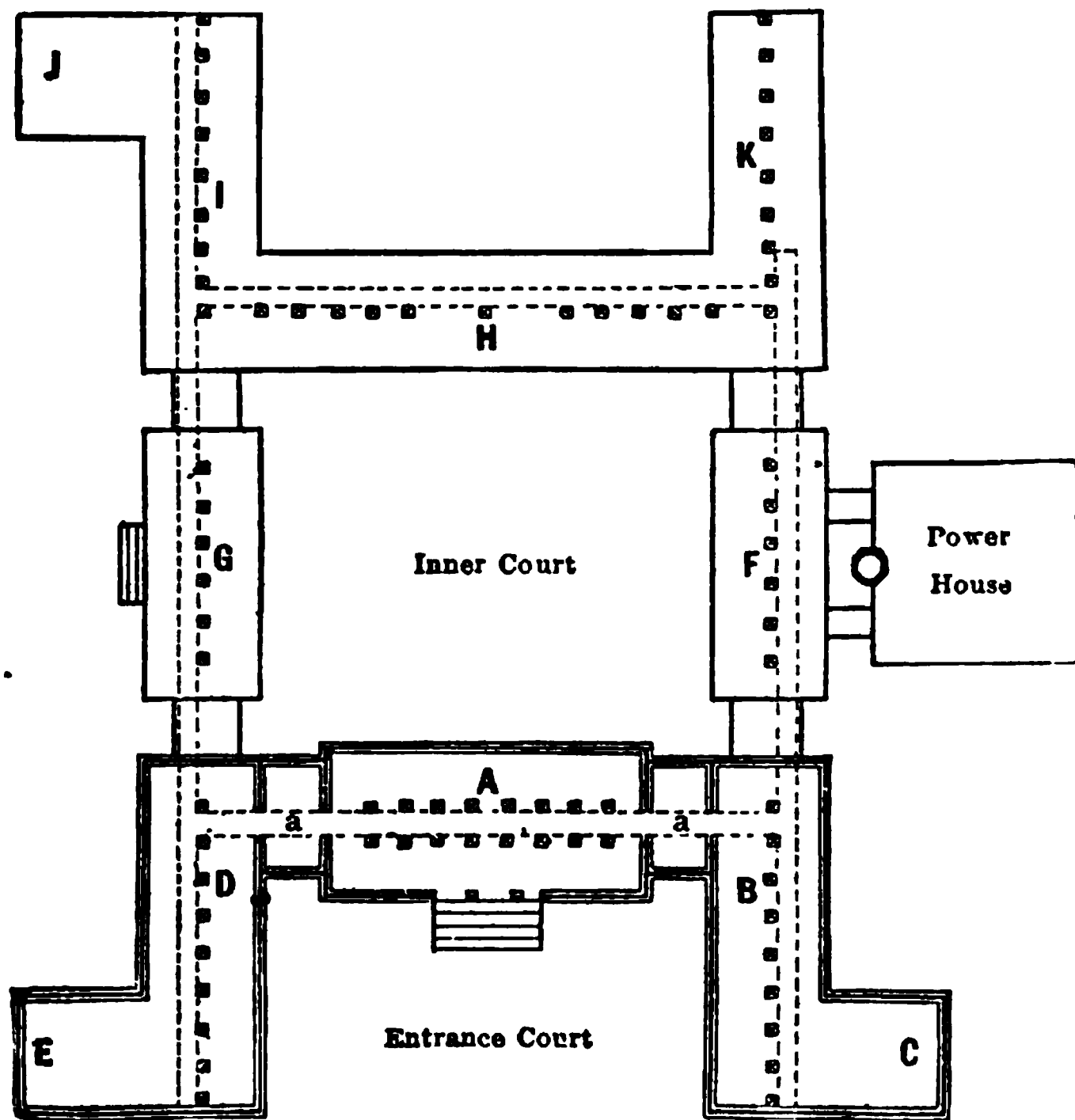


FIG. 16.—Block plan showing completed buildings and probable order of development, Wentworth Institute.

rear of either end. These T and U structures may, in turn, be developed into rectangular buildings about a single or double central court. These possibilities are revealed by figure 16. The nine bays also make it possible to have either one entrance in the center of the building, or two entrances symmetrically located near either end, without having a column on the axis of the entrance.

In the case of Wentworth Institute sufficient room has been provided on all sides of the group of buildings now erected to permit extension in any direction; for example, the wing B, in figure 16, can be extended in length forward for 96 feet. It can then have a second and third wing parallel to the wing C extended at either

end of it for a distance of 96 feet; and these two wings may be connected in the rear by another building running parallel to B, forming a complete rectangle such as has already been mentioned, with two courts 48 feet square. Should all of these additions be made to this section the completed structure would have a floor space equal to four and one-third of the standard units adopted. It is, of course, not necessary to complete the whole group, nor indeed to add the units in any very definite order. The great variety of ways in which the growth can take place shows the flexibility of the plan.

CONNECTING THE UNITS OF BUILDING.

When the standard units are juxtaposed in the development of a court group of buildings no connecting links are necessary. But between such groups and simple units such as, for example, A and B in figure 16, connection must be supplied. At Wentworth Institute this is secured by a 12-foot covered passageway on the first floor and also in the basement, between adjoining buildings (fig. 16, a). The buildings are not connected on other floors. Thus neither lighting nor outlook has been appreciably impaired, nor has the architectural outline been destroyed. On the other hand, the covered passageway permits the centralization of wash rooms, locker rooms, study rooms, etc.; makes it unnecessary to face the weather in going from building to building; reduces the distance from department to department; and facilitates administrative relationships among departments and between departments and the general offices. By the same means central control of the student body is assured. Students can not enter or leave the buildings without passing the general offices in the main building. They are obliged to pass the bulletin boards at least twice daily. Habitual tardiness is easily observed and corrected and in many other ways more effective and efficient control is obtained than would be possible in buildings separated in the usual way.

SPECIAL ADVANTAGES OF THE STANDARD UNIT ADOPTED.

The standard unit adopted is arranged for natural ventilation through outside transoms, glass areas, etc. The buildings, therefore, are not dependent for fresh air upon an intricate ventilating system, which is subject to faulty operation; nor is there danger of having at some time an ill-ventilated building, because the system is too expensive to operate, as in the cases of several recent educational structures.

The dimensions of the unit involve a building with a single row of columns down the center (fig. 17). The double row is the plan upon which almost all school buildings are laid out. This common method permits a wider structure than the single row of columns used at

Wentworth Institute. But the results are all in favor of the narrower building. A single row of supports gives as wide a floor space as can be perfectly lighted from the windows; the double row gives an area too wide for good lighting. The double row clutters the area with a forest of pillars, making general observation difficult over any large room and hampering the arrangement and movement of equipment. Moreover, the single row of supports, permitting a unit of 48 feet wide by 144 feet long, carries floor area which will admit the selection of a maximum standard size of shop or laboratory. This maximum standard is based upon the distance over which an instructor can control a group of students without unnecessary movement about the room for purposes of observation and discipline. This standard shop is in the general proportion of 50 by 100 feet.

Among the advantages which accrue from the adoption of any standard unit is that of easy and simple adjustment of departments when, in the process of growth or reorganization, they are moved

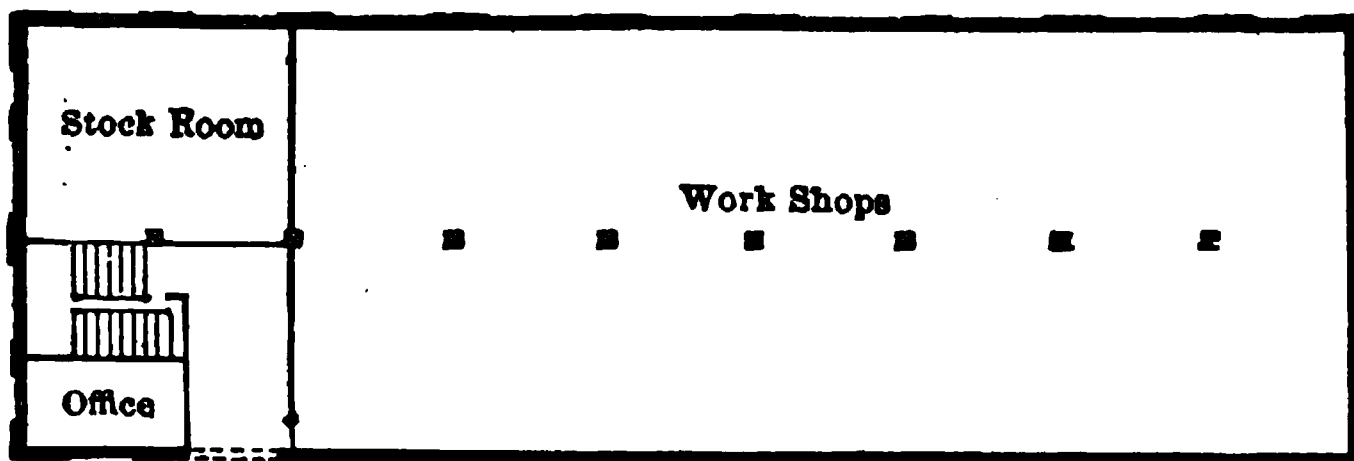


FIG. 17.—Standard unit divided for instruction in shops, Wentworth Institute.

from building to building. Furniture, machines, all equipment which fitted in one shop will fit in another of the same proportions. The equipment which stood in a certain corner can easily be disposed in the new quarters in an analogous corner. The economy of time and effort which is made in this regard is as important as the economy of funds through not having to purchase substitute equipment. This is a very considerable saving. Wentworth Institute has had several occasions to test it. The adjustment of the plant to the housing and instruction of the training detachment of soldiers has been one instance. And when each additional building was finished the expansion involved a similar adjustment. For instance, the drafting courses' equipment was once all in the west building; then all of it was moved to the main building; later part was moved on to the east building, when that was completed. Every piece fits in its new place and no substitution purchases have been necessary.

Expansion and readjustment are further simplified by the fact that all partitions except those covering stairways are removable, though soundproof, and all rooms may be thus decreased or increased in size to suit immediate uses. By this scheme fitness alone

need be consulted in placing departments in new quarters in another building. If the floor best suited for a certain department which uses a large shop formerly housed a group of recitation rooms and offices, the temporary partitions form no obstacle to placing that department on that floor. (Compare fig. 17 and fig. 18.) By virtue of this removability of partitions the arrangement not only of the departments with relation to one another but within the department becomes highly flexible and makes it possible for the institute to set a high standard in efficient use of floor space and in its plan for simple and direct travel of materials and workers.

THE ARRANGEMENT OF THE STANDARD UNIT FLOOR.

The standard unit may be divided for instruction in shop practice (fig. 17) or it may be divided for recitation rooms, lecture rooms, etc. (fig. 18). Where large shops or large laboratories or drawing

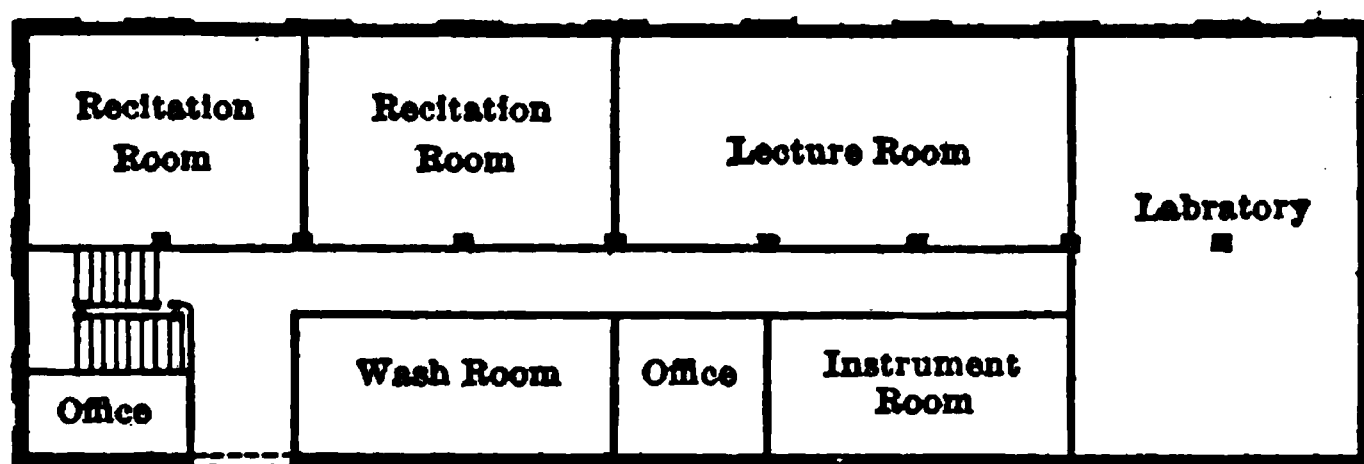


FIG. 18.—Standard unit divided for recitation rooms, etc., Wentworth Institute.

rooms are required, the full width of the building is used, and the rooms may be 32 feet, 48 feet, 64 feet, 80 feet, 96 feet, or 112 feet long, as desired. When recitation or lecture rooms are required, a corridor about 8 feet wide is run on one side of the center row of columns, making rooms 24 feet wide on one side of the building, and

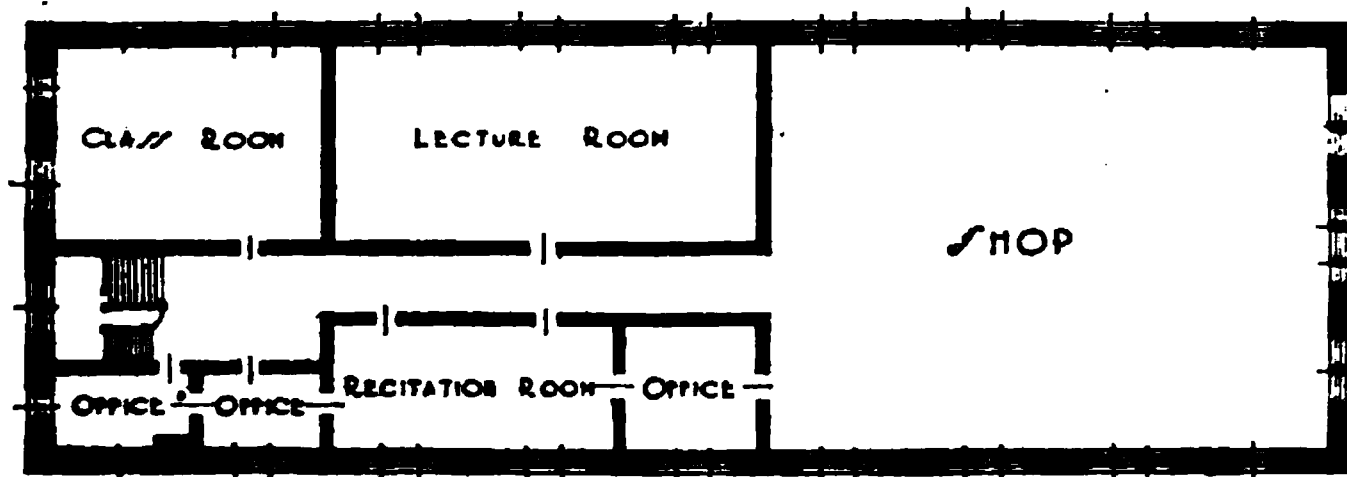


FIG. 19.—Standard unit arranged in a special combination, Wentworth Institute.

about 15 or 16 feet wide on the other. Recitation or lecture rooms are naturally made 24 by 32 feet or 24 by 48 feet. Both of these are very convenient sizes. The narrow space on the other side of the corridor, too, divides itself readily into offices 16 feet square, or instrument rooms, wash rooms, etc., 16 by 32 feet, or 16 by 48 feet. It would be difficult to select dimensions for a standard building

which could be divided more readily into rooms of convenient sizes for all sorts of purposes, or in more convenient combinations.

GENERAL REVIEW OF BUILDINGS.

The buildings of Wentworth Institute may be conveniently designated as the west building (right of photograph, fig. 15), main building, east building (left of photograph, fig. 15), and the power-plant laboratory. Of these the west building and the power plant were finished when the school opened in 1911; the main building was completed in 1914; and the east building in 1916.

The steam power plant laboratory is about 80 feet square and is located to the rear of the façade group (fig. 16).

The main building is 132 feet long by 66 feet wide. It contains in the basement a large laboratory about 60 feet square, with adjoin-

FIG. 20.—Floor plan of power plant laboratory, Wentworth Institute.

ing offices, for electrical-power practice and work in electrical construction, a second large laboratory for architectural construction, and a large locker room and a washroom. On the main floor are two large lecture rooms and the administration offices. The entire second floor is devoted to construction in mechanical and architectural drawing and design. On the third floor is an assembly hall and gallery. The remainder of the third floor and gallery is occupied by laboratories, stock rooms, and offices for instruction in applied science and practical mechanics.

The west building is chiefly a shop building, 145 feet long by 49 feet wide, with four high-posted stories and a well-lighted gallery floor for workshops, laboratories, and classrooms; and a small one-story wing extending to the south for offices, which serves also as the passageway to and from the main building. In this building are, on the top story, a large shop for electric wiring, a plumbing shop;

a pattern shop, with stock rooms, tool room, offices, etc., occupies the whole of the second floor; a machine shop of equal size and somewhat similar appointments occupies the first floor; below are a foundry

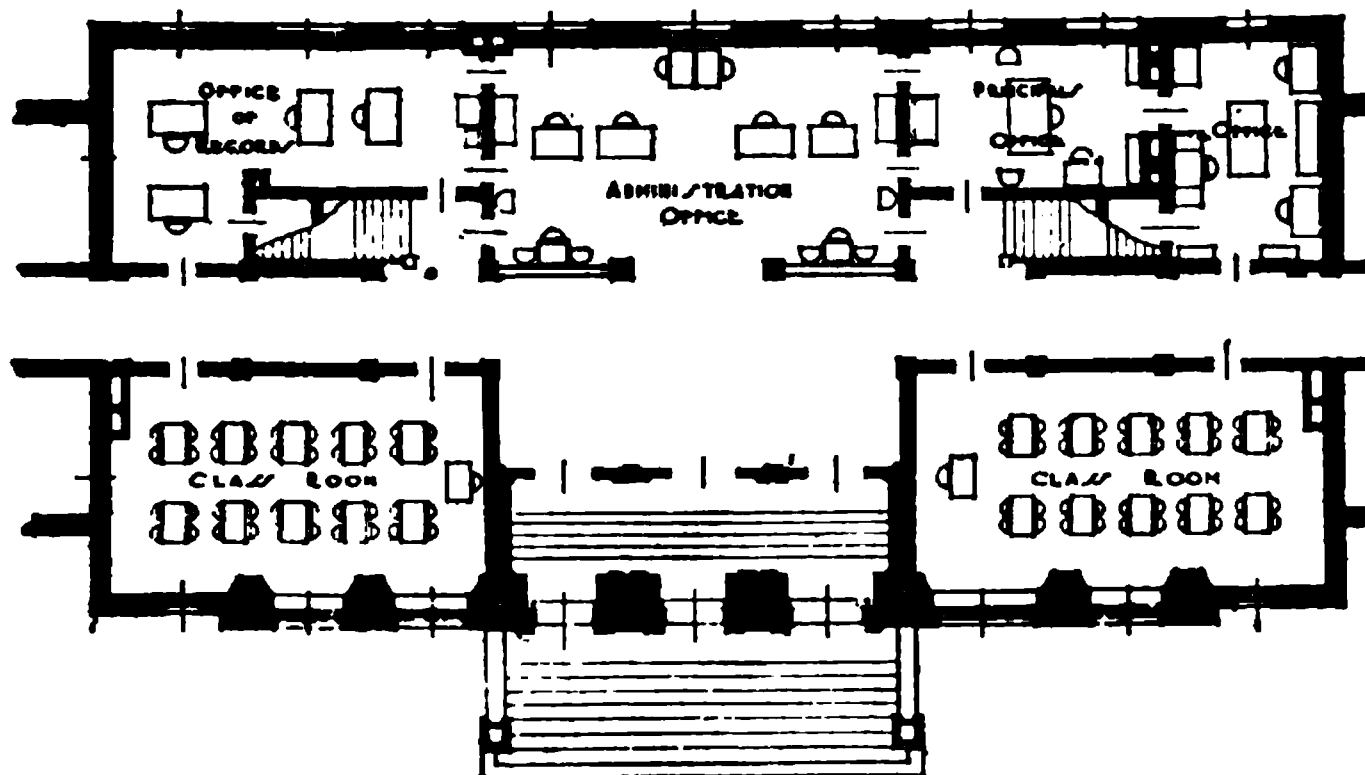


FIG. 21.—Main floor of main building, Wentworth Institute.

and finishing room, with rooms for pattern storage and supplies, occupying a floor space over 50 by 100 feet. There is also a gallery floor for cupola charging, core making, brass molding, and metal-

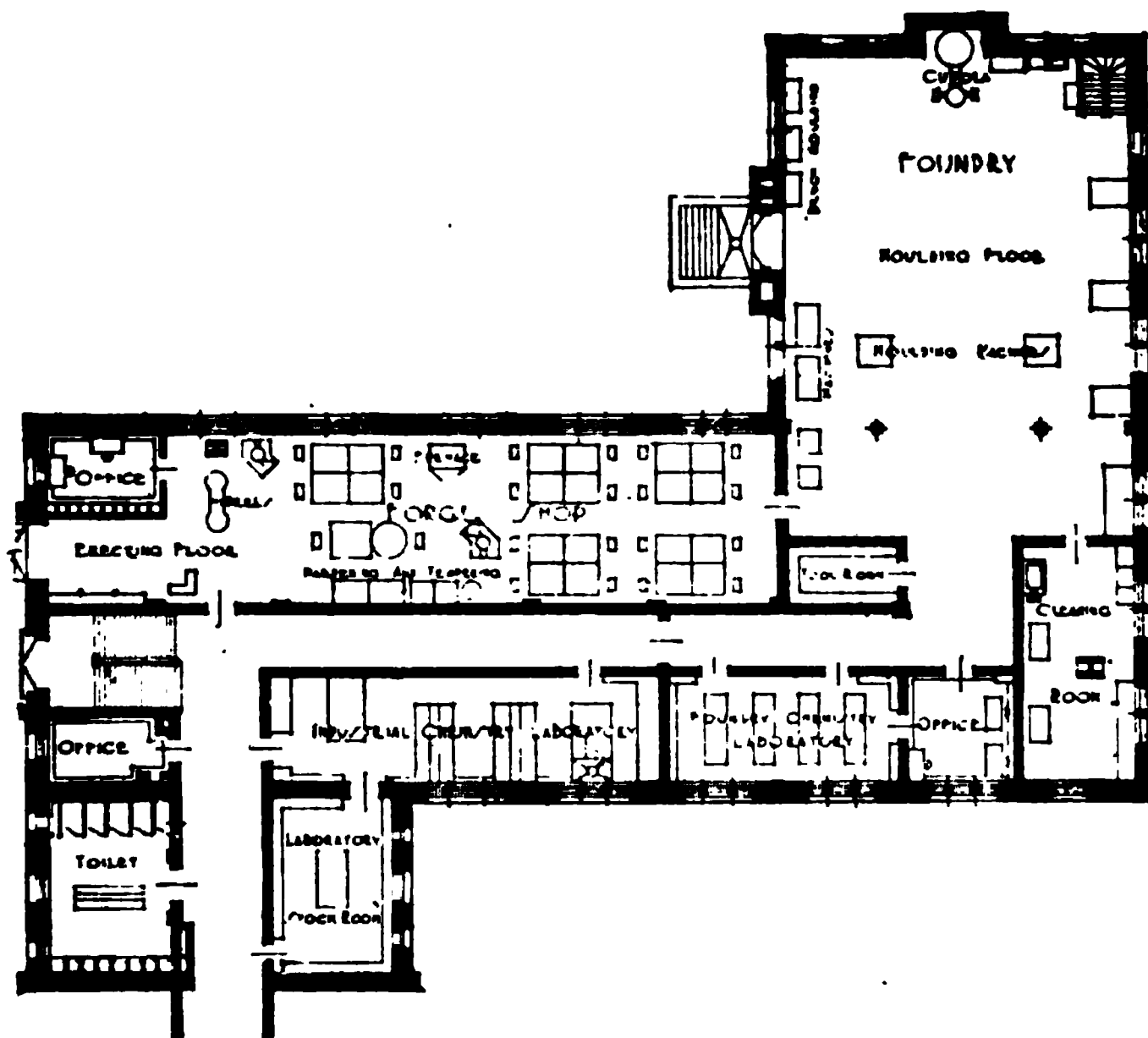


FIG. 22.—Ground-floor plan of west building, Wentworth Institute.

pattern making; two laboratories for industrial chemistry; a blacksmith's shop and a hardening plant; and a large lecture room and three smaller rooms for class exercises and recitations.

The east building, which contains about 45,000 square feet of floor area, provides four additional classrooms, large laboratories for

FIG. 23.—First-floor plan of west building, Wentworth Institute.

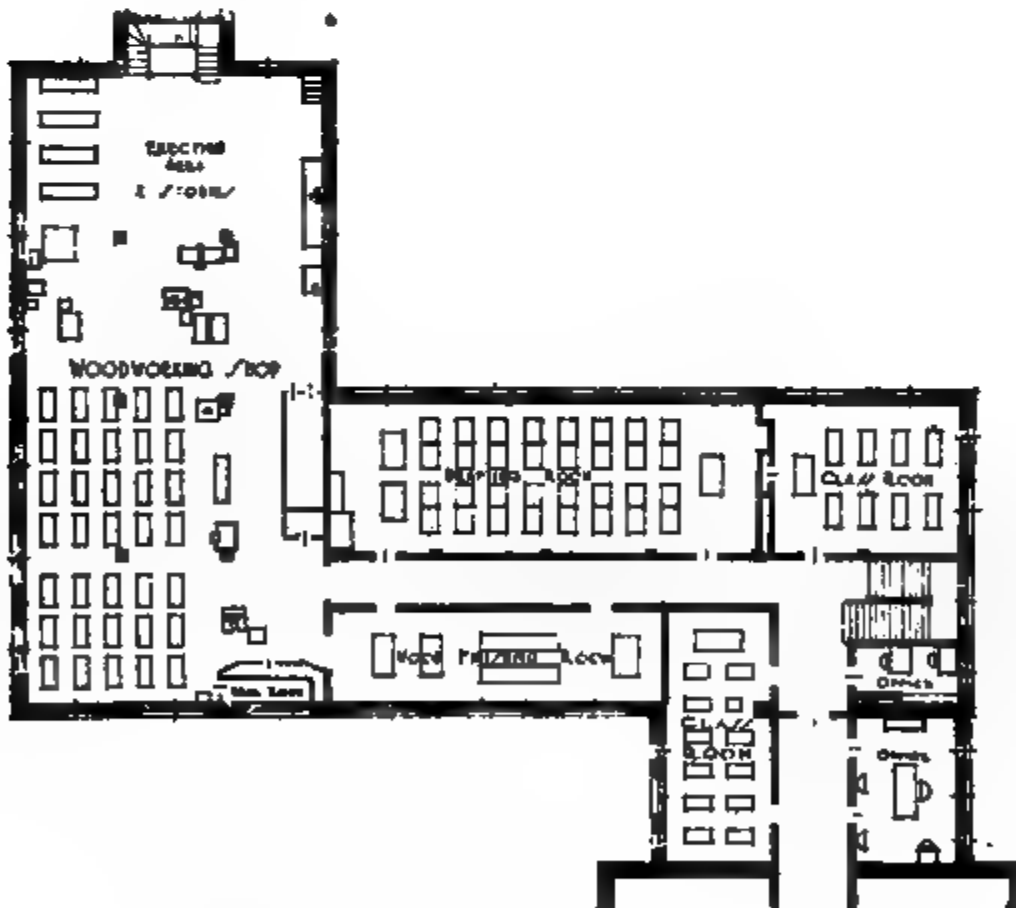


FIG. 24.—Plan of first floor of east building, Wentworth Institute.

strength of materials, reinforced concrete, and building materials. It also provides two shops for carpentry and house building and three entire floors for the school of printing and the graphic arts.

PART II. EQUIPMENT, COURSE OF STUDY, AND METHODS OF INSTRUCTION IN CARPENTRY.

I. EQUIPMENT FOR A CLASS OF 10 PUPILS IN CARPENTRY.

1. Processes in Carpentry for Which Tools Are Needed.

Whenever a class in industrial education is to be organized a careful survey of the processes involved in the industry should be made. It is essential that the tools purchased for the equipment should be ample for carrying on the processes which the trade involves. The following statements refer to the preparation of young men for the general carpentry trade, and not to specialized framers or finishers. The construction of a frame building will be used to illustrate the processes in carpentry of which a general carpenter needs to possess a working knowledge.

(a) **STAKING OUT BUILDING FROM PLANS AND SPECIFICATIONS.**—In building operations it is frequently the duty of the carpenter to act as the foreman on the job, and he is frequently called upon to set the grade and witness stakes for the excavation. This involves a knowledge of the right triangle and the use of a builder's level in determining the grade.

(b) **LEVELING AND SQUARING UP WOODWORK ON FOUNDATION.**—After the foundation is complete, the real work of the carpenter begins. Most of the framing is done with dimension lumber, and does not involve measurement closer than an eighth of an inch. The use of the saw and square is frequently required in cutting studding, joists, rafters, and in roof framing. As the work progresses, the plumb and level must be constantly used on all walls and floors. Stair construction involves a knowledge of mathematics similar to that used in roof framing. Most carpenters rough in stairs and frame roofs as a matter of rote, and are lost when the stair rise and treads are out of the ordinary, or when the pitch of the roof is unusual. Instruction covering these two processes should enable the pupil to handle any problem which may be given him in the erection of the building.

(c) **OUTSIDE FINISH.**—After the building is framed the processes involve shingling, siding, cornice, and belt courses. For this work special tools are required. The outside finish does not require as high a degree of skill as the inside finish, though it is frequently necessary that material be cut to a precision of less than a sixteenth of an inch. Since most of the outside work is done on a scaffold, the worker

uses a small number of tools. These comprise shingling hatchets, block, smoothing, and jointing planes, and both cross-cut and rip saws. The carpenter's square and try-square are always in use throughout the construction of a building. In making window frames it is often desirable to use a combination plane usually known as a "Stanley 55."

(*d*) **INSIDE FINISH.**—The demands for accuracy are much greater on the inside of a building than those in framing or on the outside finish. Special tools are required for hanging windows and doors; in cutting and fitting window and door trim; in column and panel work; and in cabinet construction. In stair building it is often necessary to construct jigs, or to use special tools in housing in the risers and treads. Most modern houses are finished with hardwood floors. This not only involves the laying of the floor with a saw and hammer, but also the scraping of the floor for which either a hand or machine scraper may be used.

(*e*) **MACHINE WORK.**—The carpentry trade frequently demands of the individual an ability to operate mill machinery for the purpose of getting out stock on the job. Modern building construction, in the interests of efficiency, makes necessary the installation of certain machine equipment. This equipment is used for the purpose of cutting dimension lumber, milling window-frame material, and for piecework. The operator is not expected to be a skilled mill hand, but must know certain processes which enable him to set up, care for, and operate the machines.

2. Tools Which Should be Included With the Equipment for a Class of 10 Pupils in Carpentry.

A school organized for the purpose of giving instruction in carpentry should include in its equipment tools needed for practice work in all of the processes involved. Each pupil should be furnished with an individual tool for all of the more common processes. Certain special tools may be purchased in lots of one or more for use by individual pupils as the need may arise. As a means of classification the tools have been grouped as follows:¹

(*a*) Carpenter's level, with adjustable sights, or a builder's transit, and a 100-foot steel tape, graduated in inches.

(*b*) Edge tools: Rip, crosscut, coping and compass saws; block, smoothing, and jointer planes; ordinary and ratchet braces, with full set of twist, auger, and drill bits; framing and firmer chisels and gouges for curved work; spoke shaves; hand axes and hatchets, represent most of the edged tools which will be needed for this course.

¹ For a complete list see Appendix.

(c) **Measuring tools:** Framing and try-square; marking, pencil, and slitting gauges, with both folding and extension rules.

(d) **Miscellaneous tools:** Nail sets, wrenches, miter boxes, flat and bell-faced hammers, screw drivers for light and heavy work, flat and saw files, rasps, pliers, etc.

(e) **Power machines:** A universal saw, jointer, band saw, planer, cut-off saw, boring machine and grinder, or in place of all these one universal woodworker, which comprises all six machines in one.

In writing the specifications for the tools to be included in any equipment, it is desirable that only tools of the highest class be purchased. Pupils given edged tools which are poorly tempered often become discouraged by the necessity of frequent sharpening and their inability to obtain a good cutting edge. Teachers or supervisors of industrial subjects should therefore arrange to include in their specifications only those makes that are known to be standard.

II. COURSE OF STUDY FOR AN ALL-DAY SCHOOL GIVING INSTRUCTION IN CARPENTRY.

1. A Preliminary Survey of the Industrial Field.

In selecting the equipment and in making out the course of study, the needs of the industry in the community should be considered. In some sections of the United States the carpenter's trade differs materially from that in other sections. It is safe to say that before purchasing equipment or making out the course of study the advice of men who are familiar with local conditions and who are masters of the trade should be obtained.

When formulating courses for trade schools the purpose of the school or class must be considered and the subjects included in the course must be carefully weighed in terms of their value as a part of the needs of the particular trade.

2. Division of the School Day.

In preparing the course of study the length of the school day should first be determined and then divided into shop practice, related subjects, and nonvocational subjects. The following may be considered as a satisfactory division of the time to be devoted to each of the three kinds of work in an all-day school:

(a) Shop practice-----	50 per cent; 15 hours per week.
(b) Related subjects-----	33½ per cent; 10 hours per week.
(c) Nonvocational subjects-----	16½ per cent; 5 hours per week.
Total-----	100 per cent; 30 hours per week.

Whenever the pupils are of mature age, the time given to shop practice may be increased to meet the needs of the pupil.

3. Suggested subjects and hours per week for a two years' course in an all-day school.

First year.		Second year.	
Subject.	Hours per week.	Subject.	Hours per week.
Shop practice.....	15	Shop practice.....	15
Applied mathematics.....	3	Applied mathematics.....	3
Applied science.....	2	Applied science.....	2
Applied drawing.....	5	Applied drawing.....	5
English.....	3	English.....	2
Civics.....	2	Industrial history.....	3
Total.....	30	Total.....	30

4. Subject Matter for Shopwork.

The course of study must provide an opportunity for developing a knowledge of all the processes involved in the trade, and an opportunity for acquiring a reasonable degree of skill in the use of tools and in the application of each process. Since carpentry as a trade deals almost entirely with house construction and house repair, the subject matter for the course in carpentry is based on the erection of a frame building. The following outline will serve to indicate the subject matter which should be included in the course. On account of the limitations as to the length of this bulletin, it will be impossible to enter into an extended discussion of each process.

5. Processes Involved in House Construction.

- (a) Staking out the building from the plans and specifications.
- (b) Leveling and squaring up framework on foundation.
- (c) Roughing-in framework.
 1. Studding, joists, box sills, balloon framing, braces, etc.
 2. Roof framing, cutting rafters, etc.
 3. Roughing in stair work.
- (d) Outside finish.
 1. Shingling, ornamental and common.
 2. Siding.
 3. Cornice and belt courses.
 4. Making window frames for brick and frame houses.
- (e) Inside finish.
 1. Hanging windows and doors.
 2. Window and door trim.
 3. Column and panel work.
 4. Cabinet construction.
 5. Stair building.
 6. Laying and finishing hardwood floors.
- (f) Machine work in getting out stock.
 1. Setting up machines.
 2. Operation of machines.
 3. Grinding knives.
 4. "Shop kinks."

6. Subject Matter for Related Work.

The time given to a study of related subjects in a course in carpentry should vary from 30 to 40 per cent of the school day. If trade schools propose to send out from their courses young men who are well prepared to undertake the increasing technical duties connected with the trade, it is necessary that careful attention be given to the organization and to the conduct of the related work.

(a) **APPLIED MATHEMATICS.**—Carpenters without the advantage of a working knowledge of mathematics are handicapped and unable to compete with their fellow workmen. The mathematics given in a course in carpentry should be taught with the needs of the trade in mind, and the problems used to illustrate the principles should originate as far as possible in projects carried on during the shop-practice period.

The mathematics required in carpentry includes a knowledge of arithmetic and the application of certain elementary principles of algebra, geometry, and even trigonometry, though none of those subjects should be given with the academic point of view. In roof framing and stair construction there are excellent opportunities for the application of geometry and trigonometry. In the construction of windows it is frequently necessary to use an unknown quantity with simultaneous and quadratic equations. It is not necessary, however, that the pupil should study these equations as such or acquire great skill in the elimination of several unknown quantities.

(b) **APPLIED DRAWING.**—In applied drawing the teacher has an opportunity to give the pupil a new language. Mechanical drawing, when taught with the purpose of enabling the individual to lay out upon a sheet of paper his ideas in such a way that others may take the drawing and read its story, is necessary in the preparation of an individual as a skilled workman in the trade of carpentry. It is also essential that the individual should be able to read plans prepared by others, in which the terminology and conventions used vary from his own standards. In the same way in which mathematics and science are applied to shop practice, mechanical drawing should look to the projects in the shop for its inspiration for subject matter.

7. Subject Matter of Nonvocational Subjects.

Every individual during his school life is entitled to as much general training for citizenship, and appreciation of all the things which have to do with the community and national life as it is possible for him to acquire while at the same time preparing to earn a living and to support those who may be dependent upon him.

As a means of rounding out the course of study and giving the above training to the individual, the course of study should include

(a) English, (b) civics, and (c) industrial history. These subjects may be vitalized and made of much greater interest than usually attends upon their study in secondary schools, by drawing upon the technical knowledge obtained by the pupil in his shopwork and in the related subjects. The teacher of nonvocational subjects should keep in close touch with both of these departments and closely relate the progress made in nonvocational work with that made in other work.

III. METHODS OF INSTRUCTION.

1. Shop Practice.

(a) **PROJECT METHOD.**—An understanding of the use of the “subject matter” in shop practice is one of the fundamental qualifications of a successful shop teacher. A skilled journeyman may know all of the processes of his trade, but unless he has such skill in the organization of his knowledge as to be able to present it to his pupils in a clear and logical manner, he will fail to secure results. In teaching as well as in other professions and in industry a man succeeds and rises above his fellows in proportion to his skill. Broad practical experiences in industrial methods obtained in working on projects constructed on a useful or productive basis are much more satisfactory than the limited experiences gained in working upon small illustrative exercises.

In every public-school system a large number of things are needed which can be made in shops of this kind. Kindergarten tables, primary tables, dictionary stands, stools, gymnasium apparatus, playground apparatus, teachers' desks, repair work on school buildings, and the construction of new temporary school buildings are some of the projects which are always needed in the school system and which offer an opportunity for acquiring skill in carpentry.

As a concrete illustration of the use of the “productive shop in teaching carpentry” the following is a good example: Let us assume that the school system requires a new temporary school building for an outlying district or for expansion purposes in an older district.

The director of vocational education should establish working relations with the architect and engineer of the board of education and with the building committee. A definite proposition should be transmitted to the board of education showing the manner in which he will be able to use the building as a “productive project” and the time required to complete the work. This will require building experience on the part of the director or information obtained through the teacher of carpentry.

The request to the board of education should make clear that the “project” is to be used for the purpose of giving trade experience to the class in carpentry and that the project is necessary for that

purpose. After the request is granted and the architect is instructed to prepare plans, the teacher should begin the related work with the pupils.

Two propositions should be clearly understood by the public:

(1) That the productive project is being used as a means of giving real, practical experience to the pupils and that the teacher is capable of utilizing the material for instruction purposes.

(2) That from the standpoint of the school authorities the productive project is not being used to exploit the pupils and thus effect a saving in the construction of the building.

Experience goes to show that if the pupils are paid an average wage of 15 cents per hour for productive shopwork carried on during the summer vacation and on Saturdays, no material saving is effected to the school district other than relieving the school of the heavy cost of supplies necessary to give practice work to pupils in nonproductive classes. Usually the cost of material for such productive enterprises, plus the cost of pupils' and teacher's labor, will average about 80 per cent of the market value of the product. The overhead charges such as heat, light, rent, power, supervision, and bookkeeping will average about 20 per cent, so that the school stands even, so far as the expense is concerned. It has, however, obtained a first-hand contact between the pupil and industry—a contact which can be obtained in no other way.

The director should now take the plans from the architect and place them in the hands of the teacher of shopwork, of the teacher of the related subjects, and even of the teacher of nonvocational subjects for discussion and analysis. The teacher of mechanical drawing should have the pupils prepare details of window and door frames, cornices, roof framing, corner construction, to be submitted to the shop teacher for approval.

Under the direction of the shop teacher, a bill of material is prepared and submitted to the purchasing agent. Arrangements are made by the director through the architect for subletting such contracts as masonry, sheet-metal work, electric wiring, and plumbing for which no classes are organized.

When a clear understanding has been reached by the pupils as to what the plans call for and what material is specified, the construction should begin. One teacher can not use more than 10 pupils in a class of this kind. His entire time will be taken up in the close supervision of the work of each individual and in giving general instruction as the work progresses.

It is necessary to the success of the project that all methods used should be those practiced in the industry. All pupils should wear carpenter's clothing, use man-size tools, and become accustomed to the use of technical and trade terms as applied to carpentry.

The accompanying photograph serves to illustrate a project. Ten boys under the direction of a skilled teacher were engaged 1,600 pupil hours in the construction of this building. The construction involved practice in most of the common operations connected with the carpenter's trade.

(b) **THE EXERCISE METHOD.**—In addition to the productive projects which may be used for the purpose of giving instruction in carpentry, it sometimes will be found necessary to utilize the "exercise method" to illustrate certain principles for which a productive project is not available. This method may be used for teaching roofing construction, squaring, jointing, and gluing stock, and the use of certain special tools. It is well to bear in mind however that the best experiences which the pupil can obtain, and those which create the greatest interest on his part may be obtained from the productive

FIG. 25.—A typical temporary frame school building which is used as a "productive project" in the vocational work at the Kansas City (Mo.) public schools.

project. It is an inspiration to boys to know that the article upon which they are working is one that will be used and not something that is being made for practice work.

(c) **CLASS INSTRUCTION.**—Shop projects and exercises should always be accompanied by both class and individual instruction by the shop teacher. In the diverse applications of the principles which have been illustrated, it is self-evident that the great variety of problems which the worker encounters can not be reproduced in the classroom, and that many of them can be taught through lectures and demonstrations to the entire class by the shop teacher.

It is often time well spent for the teacher to take his pupils on trips to buildings under construction and to show them the methods used by industrial concerns in the construction of types of buildings which it is impossible to use as productive projects.

2. Related Subjects.

(a) **APPLIED MATHEMATICS.**—In the methods of instruction applied to mathematics, the teacher should give concrete problems related to the trade. The problems should be inspired by the real need of a solution, and not made in an abstract form.

The solution of the following problem illustrates how applied mathematics may be related to carpentry. Let us assume that the pupil is engaged, while in the shop, in framing the roof of a frame house.

1. *Problem:*

What is the length of a common rafter?

2. *Information necessary to solution:*

a. The width of the house from plate to plate = 30 feet.

b. The pitch of the roof = $\frac{1}{3}$.

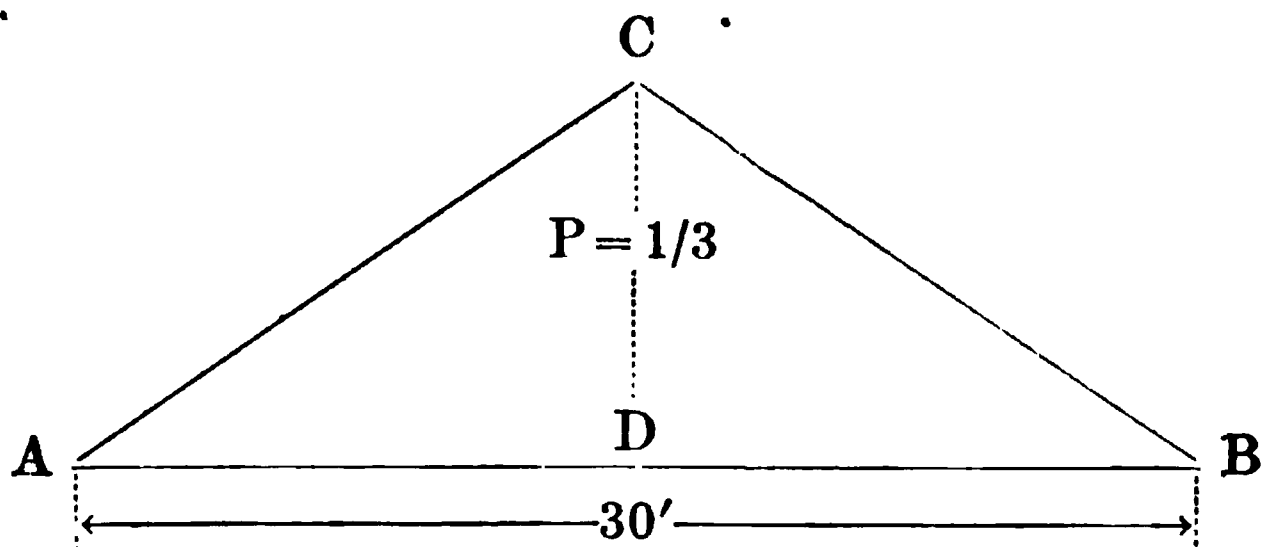
3. *Previous knowledge necessary to solution:*

a. A knowledge of the right triangle.

b. A knowledge of the meaning of "pitch."

c. How to extract square root.

4. *Solution:*



Given $AB = 30'$

and $CD = \frac{1}{3}$ of AB or $10'$

Also $AD = \frac{30}{2}$ or $15'$

$AC = ?$

In a right triangle the hypotenuse is equal to the square root of the sum of the squares of the other two sides.

Therefore

$$\begin{aligned} AC &= \sqrt{AD^2 + CD^2} \\ &= \sqrt{225 + 100} \\ &= \sqrt{325} \\ &= 18' - 3/8'' \end{aligned}$$

5. *Proof:*

a. With a carpenter's square the pupil should lay out in the shop a common rafter for this roof, and measure the length of the rafter.

6. *Applied drawing:*

In applied drawing the pupil should be required to detail the roof to scale, and measure the length of the common rafter.

7. *Application to applied science:*

What would be the *relative* strength of the roof if framed with 2 by 4 rafters spaced 16 inches on centers as compared to the same roof using 2 by 6 rafters spaced 24 inches on centers?

(This involves a very elementary knowledge of the strength of materials such as should be included in a course in applied science.)

8. *Supplementary problems:*

a. Find the length of a hip or valley rafter.

b. Find the lengths of the jack rafters (spaced 16 inches on centers).

c. Calculate the number of common, hip, valley, and jack rafters needed to frame the roof.

d. How many board feet of lumber will be required to frame the roof?

e. What will be the cost of the dimension lumber required to frame the roof at \$35 per M?

Similar abstract mathematical problems given without application to the shop work of the pupils might be stated as follows:

(1) Find the length of the hypotenuse in a right triangle having sides equal to 10 feet and 15 feet, respectively.

(2) How many board feet of lumber is contained in 52 pieces of 2 by 6 timbers each 20 feet long?

(3) What is the cost of 1,040 board feet of dimension lumber at \$35 per M?

The standard customs in calculating quantities and costs which are followed in the community should be recognized in the solution of all problems. This may be illustrated by the localized use of a "perch" in stone masonry. The legal perch contains $24\frac{3}{4}$ cubic feet. There are few, if any, communities in the United States, however, which use this quantity. In many localities $16\frac{1}{2}$ cubic feet is known as a perch and in others 22 cubic feet is used. The courts have recognized these local customs, and contracts are made in these communities without reference to the number of cubic feet given in the standard perch.

Problems in related work should always recognize the customs which exist in the locality. The teacher must familiarize himself with the local conditions in the solution of the problems. It is well

for the teacher of related mathematics to keep in close touch with the shop work of the pupils. This is desirable as a means of collecting problems which are vitalized by the immediate need of a solution on the part of the pupil. The teacher of related work and the teacher of shop work should visit each other's classes frequently and exchange ideas relating to the subject matter and methods of instruction for their respective classes. An ideal situation for a trade class in carpentry would provide a shop teacher qualified to instruct his pupils in not only the shop work, but in the related subjects as well. This will not be possible as a general rule for many years to come, for the reason that most shop teachers are deficient in technical training.

Some schools employ two teachers in each shop. One possesses trade experience, and the other technical and professional qualifications. The one is responsible for the shop work, and the other for the related technical instruction. By this means, a greater degree of cooperation is obtained. The shop teacher becomes familiar with the related subjects, and the related teacher is enabled to select his subject matter in relation to the work of the pupil. This arrangement also permits the shop teacher to take part of his pupils away from the building on productive work.

(b) **APPLIED SCIENCE.**—In a trade school, the primary object of applied science is to teach the applications of the principles of general science, especially those which relate to industrial purposes and which are necessary to explain the scientific principles which underlie the shop and trade processes. Applied science is in constant touch with the industry, and unless it is given a vocational contact, it is of very little value in the vocational school.

In order that we may accomplish this above purpose, our science laboratories must be equipped with industrial apparatus and with shop materials, such as will enable them to maintain commercial conditions in all laboratory tests. In teaching carpentry, it is desirable that the worker be taught the elementary principles of the block and tackle, the lever, the jack screw, the gas engine, and the builders' derrick, as well as the elementary principles of the electric current as it relates to house wiring. An elementary knowledge of strength of materials with simple bending, shearing, tensile, and compression tests should be included. It is frequently necessary that the carpenter use his judgment as to the erection of scaffolding and the selection of timbers for various members of the framework. This judgment is more reliable if he has an elementary acquaintance with the relative strength of timbers in the various ways in which they may be placed in the structure.

(c) **APPLIED DRAWING.**—The teacher of applied drawing will find a fertile field for class problems in the projects carried on in the

shop. Mechanical drawing is best taught without the usual text. Few general principles are necessary in the study of this subject. Pupils taking a course in carpentry should acquire an ability in applied drawing to prepare elevations and floor plans of houses, and details of cross sections of the various parts of the building.

In order that he may illustrate the project to others, every skilled workman often finds it necessary to detail quickly a mechanical device or a part of the work on which he is engaged. For this purpose, either isometric projections may be used, or simple perspective drawings made in free-hand may serve the purpose. In connection with mechanical drawing, the teacher should give frequent drill in plan reading, and in estimating the costs and quantities of materials. Mechanical drawing as a related subject is not intended to train architects or engineers, or even architectural or engineering draftsmen, but to give such skill in related drawing as may be needed by the worker in the trade to which it is related.

3. Nonvocational subjects.

(a) **ENGLISH.**—Teachers of nonvocational subjects must be in sympathy with the vocational movement. They must be experienced teachers who are able to apply common-sense rules to the subject which they are teaching.

English is necessary for the well-rounded training of every individual in English-speaking countries. This involves an ability to spell, punctuate, and to compose letters and write on subjects which may be of interest to the individual. A great amount of time may be saved if the teacher of English confers with the teacher of related and shop subjects for material upon which to base the compositions required of the pupils.

(b) **CIVICS.**—In the study of civics, attention should be given to local, State, and National Governments, with special reference to the organization of departments and the duties of the various officials. No school can fulfill its duty without giving to the pupil an appreciation of the responsibility of citizenship. This appreciation should have for its purpose an understanding on the part of the pupil of the necessity for his assuming these responsibilities as he grows to manhood, and of his duties and relations to his fellow men.

(c) **INDUSTRIAL HISTORY.**—One of the most fertile fields for developing the interests of the pupils lies in the subject of industrial history. Modern developments in the scientific and industrial world constitute a rich field for study. Pupils in carpentry should study the resources of the United States as they relate to such common building materials as iron, concrete, and lumber, and should visit industrial concerns and enter into discussions and considerations of the many labor problems which are now confronting the entire country.

APPENDIX.

SUGGESTED EQUIPMENT FOR A CLASS OF 10 PUPILS IN CARPENTRY.

BENCH AND TOOL EQUIPMENT.		Bits—Continued.	
Anvil, Fisher, 75 pounds-----		Gimlet—Continued.	
Ax, hand -----	1	$\frac{5}{16}$ -inch -----	10
Bench, gluing, zinc top-----	1	$\frac{3}{2}$ -inch -----	10
Benches, work, single-----	10	$\frac{1}{2}$ -inch -----	10
Bevels:		Screw driver-----	10
6-inch T, Stanley No. 1806---	10	Braces, ratchet:	
10-inch T, Stanley No. 1808---	1	8-inch sweep-----	10
Bits:		10-inch sweep-----	1
Auger—		Brushes:	
Irwin, 3/16-inch-----	10	Counter, 12-inch-----	10
Irwin, 4/16-inch-----	10	Glue-----	10
Irwin, 5/16-inch-----	10	Chisels:	
Irwin, 6/16-inch-----	10	Cold-----	2
Irwin, 7/16-inch-----	10	Socket and tang—	
Irwin, 8/16-inch-----	10	$\frac{1}{4}$ -inch -----	20
Irwin, 9/16-inch-----	10	$\frac{3}{8}$ -inch -----	20
Irwin, 10/16-inch-----	10	$\frac{1}{2}$ -inch -----	20
Irwin, 11/16-inch-----	10	$\frac{5}{8}$ -inch -----	2
Irwin, 12/16-inch-----	10	$\frac{3}{4}$ -inch -----	20
Irwin, 13/16-inch-----	10	$\frac{7}{8}$ -inch -----	2
Irwin, 14/16-inch-----	10	1-inch -----	20
Irwin, 15/16-inch-----	10	1 $\frac{1}{4}$ -inch -----	2
Irwin, 16/16-inch-----	10	1 $\frac{1}{2}$ -inch -----	5
Irwin -----	10	2-inch -----	5
Irwin -----	10	Clamps:	
Irwin -----	10	C type, 8-inch-----	6
Countersink—		Iron bar—	
Rose, $\frac{1}{8}$ -inch-----	5	2-foot-----	6
Snail, $\frac{1}{8}$ -inch-----	5	3-foot-----	6
Dowel—		4-foot-----	6
$\frac{1}{4}$ -inch -----	3	5-foot-----	6
$\frac{3}{8}$ -inch -----	10	Saw-----	1
Drill—		Wood, hand screws—	
$\frac{1}{8}$ -inch (for wood)-----	10	10-inch -----	10
$\frac{3}{16}$ -inch (for wood)-----	10	12-inch -----	10
$\frac{1}{4}$ -inch (for wood)-----	10	Compass, beam-----	1
Expansion Stearns, $\frac{1}{4}$ to 3-		Dividers, wing:	
inch -----	1	6-inch -----	10
Gimlet—		10-inch -----	1
$\frac{3}{16}$ -inch -----	10	Drawknives, 8-inch-----	10
$\frac{1}{4}$ -inch -----	10	Drill, spiral-----	10
$\frac{5}{16}$ -inch -----	10	Figures, steel, $\frac{3}{8}$ -inch, set-----	1

Files:	
Auger bits	10
Mill	6
Three-square, blunt	10
Gauges, marking	10
Gouges:	
Inside bevel—	
$\frac{1}{4}$ -inch	1
$\frac{3}{8}$ -inch	1
$\frac{1}{2}$ -inch	1
$\frac{3}{4}$ -inch	1
Outside bevel—	
$\frac{1}{4}$ -inch	1
$\frac{3}{8}$ -inch	1
$\frac{1}{2}$ -inch	1
$\frac{3}{4}$ -inch	1
1-inch	1
1 $\frac{1}{2}$ -inch	1
Hammers:	
Ball pein, 12-ounce	1
Claw, No. 2	10
Riveting, 9-ounce	1
Knives, putty	1
Letters, steel, $\frac{3}{8}$ -inch, set	1
Mallets, 3-inch face	10
Miter box and saw	1
Nail sets, assorted	10
Oilers	10
Oilstones:	
India, 1 by 2 by 6 inch	10
Slip, round edge	1
Planes:	
Block, Stanley No. 9 $\frac{1}{2}$	10
Combination plow. etc., No. 55	1
Jointer, Stanley No. 607	4
Router, Stanley No. 71	2
Smooth, Stanley No. 603	5
Plane bottoms:	
Stanley No. 603	10
Stanley No. 605	10
Plane caps:	
Lever for No. 603	20
Lever for No. 605	20
Plane irons, double:	
Stanley No. 603	20
Stanley No. 605	20
Pliers:	
6-inch cutting	1
8-inch cutting	2
5-inch round nose	2
Punch belt, revolving, 4 sizes	1

Saws:	
Back, 12-inch	10
Compass	1
Coping	1
Crosscut—	
20-inch	2
22-inch	25
24-inch	2
Hack, 8-inch	1
Rip—	
20-inch	2
22-inch	2
24-inch	2
Saw set	1
Scrapers, cabinet	10
Screw drivers:	
4-inch	10
8-inch	10
10-inch	10
Spiral	2
Snips, tinnerns. 3-inch cut	1
Spokeshaves	10
Squares:	
Steel—	
8 by 12 inch	10
18 by 24 inch	10
Try, 6-inch	10
Combination	1
Vises:	
Machinists', 4-inch jaw	1
Woodworking	10
Wrenches:	
6-inch knife handle, Coes	1
10-inch knife handle, Coes	1
8-inch Trim pipe	1

MACHINERY.

Electric motors, as needed.	
Emery wheels, mounted	1
Grindstones, mounted	1
Jointer, 12-inch	1
Mortising machine, hollow-chisel	1
Planer, 24-inch	1
Saw:	
Power, 14-inch	1
Cut-off, 16-inch	1

HARDWARE SUPPLIES.

Brads:	
$\frac{3}{8}$ -inch	pounds 1
$\frac{1}{2}$ -inch, No. 17	do 1
1-inch, No. 17	do 1
1 $\frac{1}{2}$ -inch, No. 17	do 3

Dowel rods:

$\frac{1}{8}$ -inch	feet	300
$\frac{1}{4}$ -inch	do	30

Nails:**Common—**

16d	pounds	100
10d	do	100
8d	do	100
6d	do	100

Finish—

8d	do	50
6d	do	50

Screws:**F. H. B.—**

2 inch by 12	gross	1
1 $\frac{1}{2}$ inch by 10	do	5
1 inch by 8	do	2
$\frac{3}{4}$ inch by 8	do	1
$\frac{1}{2}$ inch by 6	do	1

Screws—Continued.**R. H., blued—**

1 $\frac{1}{2}$ inch by 10	gross	2
1 inch by 10	do	2

R. H., brass—

1 $\frac{1}{2}$ inch by 8	do	2
1 inch by 6	do	2

LUMBER SUPPLIES.**Cypress:**

1 $\frac{1}{2}$ -inch, S2S	feet	500
$\frac{1}{2}$ -inch, S2S	do	500

Oak, red, quartered:

1 $\frac{1}{2}$ -inch, S2S K. D	do	400
1 $\frac{1}{2}$ -inch, S2S K. D	do	200
$\frac{1}{2}$ -inch, S2S K. D	do	650
$\frac{1}{4}$ -inch, S2S K. D	do	100

Pine, yellow, $\frac{1}{2}$ -inch, S2S do 200Poplar, $\frac{1}{2}$ -inch, S2S do 100

Dimension lumber as needed for productive project work.

PUBLICATIONS OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

Annual Report for 1917.

The Vocational Summary, published monthly by the Federal Board for Vocational Education (Vol. 1, No. 1, May, 1918).

- Bulletin No. 1. Statement of Policies.
- * Bulletin No. 2. Training Conscripted Men for Service as Radio and Buzzer Operators in the United States Army (International Code).
- Bulletin No. 3. Emergency Training in Shipbuilding—Evening and Part-Time Classes for Shipyard Workers.
- * Bulletin No. 4. Mechanical and Technical Training for Conscripted Men (Air Division, U. S. Signal Corps).
- Bulletin No. 5. Vocational Rehabilitation of Disabled Soldiers and Sailors.
- Bulletin No. 6. Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors.
- * Bulletin No. 7. Emergency War Training for Motor-Truck Drivers and Chauffeurs.
- * Bulletin No. 8. Emergency War Training for Machine-Shop Occupations, Blacksmithing, Sheet-Metal Working, and Pipe Fitting.
- * Bulletin No. 9. Emergency War Training for Electricians, Telephone Repairmen, Linemen, and Cable Splicers.
- * Bulletin No. 10. Emergency War Training for Gas-Engine, Motor-Car, and Motor-Cycle Repairmen.
- * Bulletin No. 11. Emergency War Training for Oxy-Acetylene Welders.
- * Bulletin No. 12. Emergency War Training for Airplane Mechanics—Engine Repairmen, Woodworkers, Riggers, and Sheet-Metal Workers.
- Bulletin No. 13. (Agricultural Series, No. 1.) Agricultural Education—Organization and Administration.
- Bulletin No. 14. (Agricultural Series, No. 2.) Reference Material for Vocational Agricultural Instruction.
- Bulletin No. 15. (Reeducational Series, No. 3.) The Evolution of National Systems of Vocational Reeducation for Disabled Soldiers and Sailors.
- * Bulletin No. 16. Emergency War Training for Radio Mechanics and Radio Operators.
- Bulletin No. 17. (Trade and Industrial Series No. 1.) Trade and Industrial Education—Organization and Administration.
- Bulletin No. 18. (Trade and Industrial Series No. 2.) Evening Industrial Schools.
- Bulletin No. 19. (Trade and Industrial Series No. 3.) Part-time Trade and Industrial Education.
- Bulletin No. 20. (Trade and Industrial Series No. 4.) Buildings and Equipment for Schools and Classes in Trade and Industrial Subjects.
- Bulletin No. 21. (Agricultural Series No. 3.) The Home Project as a Phase of Vocational Agricultural Education.

All communications should be addressed to

The Federal Board for Vocational Education, Washington, D. C.

* Emergency war training for conscripted and enlisted men.

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**AGRICULTURAL SERIES
NO. 3**

The Home Project as a Phase of Vocational Agricultural Education

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SEPTEMBER, 1918

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FOREWORD.

By the provisions of the vocational education law enacted February 23, 1917, the Federal Board for Vocational Education is charged with the duty of causing to have made studies, investigations, and reports with particular reference to their use in aiding the States in giving instruction in agriculture. When the Board deems it advisable such studies, investigations, and reports may be made in cooperation with or through the Department of Agriculture or the Bureau of Education.

This bulletin on the home project as a phase of vocational agricultural education has been prepared by F. E. Heald, specialist in agricultural education, States Relation Service, U. S. Department of Agriculture, under the direction of the Board cooperating with the Department of Agriculture. It is published in order to supply information and suggestions concerning the nature and conduct of home project work as a phase of secondary instruction in vocational agriculture.

The need for definite and tested suggestions regarding such work is emphasized by the fact that the controlling purpose of the secondary agricultural instruction which it is intended to promote under the Smith-Hughes Act is to fit for useful agricultural employment. One of the provisions of the act is that schools receiving Federal aid for agricultural instruction shall provide for directed or supervised practice in agriculture for at least six months every year. It is expected that schools maintaining federally aided courses in agriculture will devote not less than 50 per cent of the school time to instruction in agriculture, including supervised practical work. This means that there should be not less than 90 minutes of actual instruction in agriculture at the schools and not less than an average of 90 minutes every day of supervised practical work. During winter, the time given to school instruction may be increased and that given to practice work may be lessened, but the average must be maintained to meet the requirements of the law as to supervised practical work. It is evident, therefore, that the success of instruction in vocational agriculture is highly dependent upon the character of the supervised practical work.

While this work may be done on the school farm or on the home farm, the use of the home farm affords special advantages. It affords an opportunity for the boy to gain, under normal conditions, experience in the application of the farming principles which he learns at school. It enables him to practice under normal conditions the

farming processes which he sees demonstrated in connection with school instruction at the school and on near-by farms, under the direction and supervision of the teacher. It utilizes equipment already at hand and reduces the amount necessary for the school to own in order to carry on successful agricultural instruction.

Work on the home farm is supervised by the teacher in cooperation with the parent in order to make supervision effective in the absence of the teacher. School and home, parent and teacher, are brought into closer relationship and understanding. This serves as a check on the instruction given by the teacher, making it practical and locally applicable. It should be a stimulant to higher farming ideals and better farming methods in the community.

Supervised practical work on the home farm should be of two types: (1) Home practicums, like seed testing or grafting of fruit trees, and (2) home projects. Of these, the home project is obviously more important, for it is an agricultural enterprise with a definite aim, undertaken by the pupil with full responsibility on his part for the financing of the project and the doing of the work. He may not do all of the work himself but he is expected to conduct the project as a business enterprise; keeping books, taking inventories, and making a final statement at its completion. The home project is intended to throw the boy upon his own resources and develop his power of initiative, as well as give increased knowledge and skill in farming methods.

Final economic profit should be a definite aim of all such project work, as it is the aim of the farming business as a whole. This may be immediate as in the case of a production project, aimed to produce most efficiently at a least cost; or it may be more remote as in an improvement project, such as keeping records of a dairy herd for the purpose of eliminating boarders, or in a demonstration project which illustrates profitable or unprofitable methods already largely determined by experiment stations. But whatever the type or project, economic development should be emphasized as a final goal.

All these and many related topics are brought out in this bulletin. It discusses the scope and purpose of the home project and gives detailed suggestions as to project plans, agreements, records and reports, project supervision, and school instruction related to the home project. The influence of home project work on the sequence of school studies is also brought out, and the importance of seasonal sequence of studies as based on seasons is indicated.

Teachers will find in it answers to many questions and help in solving many problems connected with the carrying on of home project work.

C. A. PROSSER, *Director.*

THE HOME PROJECT AS A PHASE OF VOCATIONAL AGRICULTURAL EDUCATION.

THE APPLICATION OF THE TERM "PROJECT."

INTRODUCTION.

For many years the term "project" has been used to designate carefully planned investigations in agricultural science covering a considerable period of time, frequently demanding several years for their completion. Such plans, including aims and methods, have been submitted by the agricultural experiment stations of the several States and approved by the Office of Experiment Stations in the States Relations Service of the United States Department of Agriculture.

More recently the same term "project" under practically the same conditions has been applied to the projects in demonstration work and extension teaching carried out under the Smith-Lever Act. The term carries with it the idea of a program of importance, of some duration, and an expectation of certain tangible and valuable results.

This term "project" was borrowed first by secondary school-teachers of science and manual arts because its use by experiment stations suggested an idea of value in connection with the practical phases of teaching these subjects.

In connection with the teaching of agriculture in secondary schools the idea of projects at home crystallized and took on the name of "home project" about 1908 in Massachusetts, receiving the sanction of the State Board of Education under suitable legislation in 1911.¹ This plan, with modifications which do not change the principal points of the definition, had been adopted in most of the States which had constructive legislation on agriculture in the secondary schools previous to the enactment of the Smith-Hughes Act. In its work on secondary and elementary school agriculture, the United States Department of Agriculture had previously accepted the prevailing conception of the home project, issuing several publications on this basis.²

¹ Bureau of Education Bulletin 579, No. 8 (1914), Massachusetts Home Project Plan of Education, prepared by R. W. Stimson.

² See U. S. Department of Agriculture Bulletins 281, 346, and 385, in which the definition, appearing on p. 9 of this bulletin under the caption "The Essentials of a Home Project," is first adopted in the department.

Since the Federal Board for Vocational Education intends to develop and extend this plan, it seems undesirable that the term "home project" should be applied to less important exercises.

It is desirable also that the term "class project" shall be applied only to rather ambitious, well-planned lines of work for which we might use the term "home project" if they were located at home. The school or class project lacks the individual responsibility found in the home project, but should not lack the other features and should not be confounded with practicums, experiments, problems, and other minor exercises.

If a school leases an orchard, prunes, scrapes, sprays, tills, and does all the work needed for a year on a class basis, this is a class project as distinguished from an individual home project, but it requires similar methods and records. The pruning is a practicum rather than a project whether done by a class or by an individual, and many different practicums may be included in a single project.

The home project should not be confused with other home work which does not comply with each of the essentials, however desirable such work may be.

The word "practicum" is a rather broad term, covering the briefer exercises, demonstrations, verifications, and problems, many of which were formerly called experiments. The practicum in agriculture may be for the purpose of verification or, more frequently, to acquire skill in a process which may be needed in the project work.

According to aim, projects may be classified as—

1. Production projects, aimed to produce most efficiently at a lowest cost. This is usually the most desirable type because the possible profit makes a natural incentive.

2. Improvement projects, in which the profit may be more remote though the evidences of improvement may be large. Keeping records of a dairy herd for the purpose of eliminating boarders would be such a project.

3. Demonstration projects, in which the probability of success and profit has been largely determined by experiment stations, but the practice not adopted in the district. This, however, for all practical purposes is for either production or improvement.

NOTE.—Actual experimentation is not to be advised in secondary schools for either school or home projects, as experiments may fail and hurt the school indirectly at least. The proper field of secondary school agriculture does not include research, and in vocational schools there are too many pressing demands to make it possible to devote any time to work the outcome of which is not fairly well assured.

THE ESSENTIALS OF A HOME PROJECT.

1. A carefully drawn plan covering a *considerable extent of time, with a definite aim*, including some problems new to the pupil and outlining with sufficient detail the methods to be employed. This plan should be written and should be an exhibit in connection with the second essential.

2. An agreement between parent, pupil, and teacher, based upon the plan already prepared and so prepared as to eliminate later disagreements. The boy's financial privileges should be clearly stated.

3. Instruction in the school both in regular course and in special individual study to the end that the project work may be done intelligently and that the home may furnish the kind of laboratory practice best adapted to the school work.

4. Detailed records of method, time, cost, income, and other important factors which shall finally be summarized in—

5. A report including both a story and a complete accounting for the entire project period.

6. Supervision by a competent instructor of such a nature as to help the student to succeed in his project, to encourage him at times when difficulties arise and to hold him to his agreement; incidentally to impart instruction supplementing that of the classroom.

The supervisor should demand records of the student and should in turn make reports to his supervising officer. (These details are more fully developed in a subsequent section of the publication.)

RESULTS TO BE EXPECTED.

The home project should develop skill in certain practices, should involve management, and should insure increased knowledge of the subject matter with which the project deals. A good yield at moderate cost is one token of a successful project. It should frequently lead to improved farming, at least on the farm where the boy lives, in which sense the project may serve as a demonstration. The student should in the end have acquired confidence and ability in handling any ordinary situation which may arise in the field of his project and should be well informed in all the phases of management involved. The pupil should gain pride in the craftsmanship of his calling due to skill gained.

THE PROJECT PLAN.

Previous to the time for selecting a project the teacher should visit the pupil's home and consult with the boy and his parents as to all the conditions bearing on his agricultural course, and in particular as to his project. As far as it is possible to obtain a spirit of cooperation the instructor should learn thoroughly the farm management and the

10 HOME PROJECT PHASE OF VOCATIONAL AGRICULTURAL EDUCATION.

home conditions which may influence the progress of the boy in his work.

With the assistance of the members of the class the teacher should conduct a brief survey of the community, not a general farm management survey, but along the lines proposed for the projects of the current year only. This brief survey, conducted for class needs only, together with the visits to the homes, will provide a good basis for guiding in the wise selection of projects; will show the current changes in agricultural emphasis in the community, and will provide a concrete basis for classroom work.

GENERAL CONSIDERATIONS.

The home project selected should always be related to the main theme for instruction during the given year. If the subject in the course of study for the current year is animal husbandry, each pupil should carry a home project in animal production as his main project work. It may often be wise for him to carry an associated project, such as plant production, to provide forage for the animals, but he should not be encouraged to dissipate his energy along several lines.

Local conditions, such as soil, climate, market demands, and the availability of machinery, tend to limit the choice of projects. No project should be chosen arbitrarily because it has succeeded elsewhere. The element of probable success should be clear to the instructor. The survey of the community will help to solve this phase of the question.

The project should involve the personal interest of the pupil as a main factor. This includes not only the tastes or inclinations of the pupil, but also his physical adaptability, his home conditions, and the probable relation of his project to his future employment. An instructor frequently urges upon a boy the project which appeals to the interests of the instructor, but this should be avoided. The financial considerations and time apportionment must be settled in terms of each boy's opportunities.

Local market demands, home needs for consumption, soil, climate, topography, season, capital investment, availability of tools, machines, horse power, continuity and intermittence of labor, prompt results, margin of probable success, immediacy of motive, personal preference, attitude of parent and of the community, relative educational values, specific aim of the teacher, are some of the factors that must be considered. Except for educational values, it is not possible to say which shall control in every case.¹

The aim or purpose of the project must be clear to the pupil. The immediacy of motive has a considerable bearing on the final success except with older pupils who have a property interest in the farm.

¹ A study of Organization and Method of the Course of Study in Agriculture in Secondary Schools, by ————, H. Eaton, Ph. D., Teachers College, Columbia University, New York City.

Opportunity for financial gain will be a common motive though not always the controlling one. If the pupil is mature enough to take a deep interest in an improvement or a demonstration project, the prospect of financial profit is still likely to prove a strong added stimulus. For this reason it is desirable that the boy should own or should lease all the property involved and should be guaranteed whatever profit may accrue. In no case should the boy take up a given project because he is obliged to, though he must agree at the outset to carry out some project related to his study. He should not be allowed to begin the course without such an agreement. At this point the teacher and the pupil might well consider the preliminary phases of the "project outline" as used in some States, covering not alone one project but all projects which might be permissible, and with an aim to select the one best suited to the pupil. If the course of study for the current year deals with animal husbandry, present to the pupils the various possible projects such as the following:

1. Shall I have a poultry project?
2. Shall I have a swine project?
3. Shall I raise baby beef?
4. Shall I manage the dairy herd at home?

Others will be suggested, and under each one will be considered the main factors, which follow:

1. The pupil's interests and tastes.
2. Local conditions, soil, climate, markets.
3. Home conditions—financial, equipment, etc.
4. Probability of success measured in profit or improvement.
5. Problems involved or opportunities for learning something new.

At this point also decide several subdivisions of the usual project study outline which are matters of primary consideration, and define the limits of the project.

Example: If a poultry project is under consideration, determine the phases of poultry husbandry to be involved.

1. Shall I purchase pure-bred fowls or must I take over the farm flock as a basis of improvement?
2. Shall I aim at producing eggs for market, meat for market, breeding stock and eggs or some other end?
3. Shall I be obliged to construct new houses, to renovate and remodel old houses, or may I use good houses now on the farm?
4. Shall I plan to grow poultry feed as a correlated plant project?

Encourage the student to choose a sufficiently ambitious project. If he is in earnest, he will prefer a man-sized task to a childish or miniature project. A high school boy knows he is not doing much farming if he is caring for one pig or rearing six chicks or managing a very small garden.

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THE LENGTH OF TIME.

Brief exercises to obtain skill fall clearly under the term "practicum." Exercises covering several weeks may be merely demonstrations or verifications. Time enough should be allowed to accomplish the following:

1. To cover the entire natural cycle. Examples: For corn this would include at least from seed testing in early spring to seed corn selection and marketing the crops in the fall. It is best to begin with the selection of seed corn in the field in September and follow with fall plowing if possible. For poultry, one would start with a laying flock in the fall and finish in the early summer or would start with the incubation of eggs and close with the marketing of the grown birds or the selection of a winter flock. A garden project would close only when all crops were sold, stored, or canned. A dairy-cow project would require several months to obtain reliable records of production and to determine the improvement due to selected rations.

2. To acquire skill in all processes involved in the project.

3. To obtain a measurable profit or loss or improvement. Examples: The crop of potatoes must be harvested and either sold or a price assigned to give the greatest value to the project. Poultry feeding and egg records have no real educational value until some measurable results are evident, usually after several months.

4. To learn the lessons involved both from study and from experience.

5. To involve some general management problems rather than isolated technic.

THE WRITTEN PLAN.

When the main points are agreed upon, the outline plan should be written and this plan should be used as an exhibit referred to under the triangular agreement signed by pupil, parent, and teacher. Such a plan should be in sufficient detail to avoid dispute but not more than is necessary lest it may necessitate too frequent amendment. The plan is also needed by the teacher in outlining the instruction.

A corn-growing project (a specimen plan).

1. From seed corn selected in September and now on hand further selection and testing shall be made prior to planting.

2. Credit and time allowance shall be based on 1 acre, estimated about 60 man-hours for the season. Not less than 1 acre shall be raised under direction of the instructor.

3. The field selected in conference and which is now in sod is to be plowed this fall after 5 tons of manure have been spread. This work is to be done by the student.

4. Disking in spring shall be done by the student after conference with instructor and shall be continued until the condition of the seed bed is approved.

* * * * *

10. The seed corn (not less than enough to plant 10 acres) shall be selected while the corn is standing in the field in September, in accordance with method taught this year, and shall be cured by one of the methods used at school. An exhibit of 10 ears shall be made at the school fair.

11. The student shall husk a considerable portion of the corn but may hire assistance. The care of the corn and fodder shall be agreed to in conference and if it is not sold the value shall be considered as equal to that of like grade sold in the market or to the cost of similar feed which is purchased for the farm.

12. The project shall close after the sale or storage is accomplished, when the written report and summary accounts are approved.

Details concerning rental price of land and cost of material to be furnished by the parent should be included, also a statement as to how and when the boy shall repay the loan.

THE PROJECT AGREEMENT.

After the outline plan has been discussed and agreed upon, the project agreement should be made out and signed. It is desirable to have a uniform printed form to be filled in, and a copy of the written plan should be attached. If the boy is to lease land or animals, have a formal lease drawn in the most approved method to teach the boy the principles involved and the responsibility devolving upon the lessee.

Verbal agreements are not entirely satisfactory and certainly are not businesslike. The printed form will not only secure uniformity but will prevent the occasional omission of an important point in the contract besides providing a reference whenever questions may arise. Occasionally a man considers it a reflection on his integrity to be asked to sign an agreement, in which case a compromise may occasionally be necessary. The same holds true in the case of a lease.

The following form has been tried and found workable in some schools and is suggested as a basis for working out a form in other schools:

AGRICULTURAL HOME PROJECT AGREEMENT.¹

..... Vocational School.

I,, agree to permit my to carry out at
(Name of parent.) (Son or daughter.)
 home the project of

¹ This is essentially the form used in 1917 by the Eighth District Agricultural School at Manassas, Va., in cooperation with the States Relations Service.

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(according to the plan submitted); to encourage the pupil and to {give
lease
sell

..... as agreed upon
(Specify land, animals, equipment, etc.)

in addition to allowing the time required; to allow him all actual profits from his project; also to check up the time records and vouch for the same.

I,, agree to carry out all the details of the project as agreed
(Name of pupil.)

upon, to record and report truthfully upon all items of labor, cost and income, and to write a full report of all methods to be returned to the teacher. It is estimated that the labor involved will be between and man hours.

I,, agree to assist the pupil in obtaining information needed
(Name of teacher.)

and to secure all possible supervision; to accept the work when the project is acceptably completed as equivalent to of school work and to enter the rank for the
(Amount.)

work and report as a part of the scholarship rank with a weight.....

This agreement entered into this the day of, 191 ..

....., Parent.
....., Pupil.
....., Teacher.

One copy of this agreement should be kept at the boy's home and one filed at school. It will frequently be desirable to have a third copy provided for the State inspector, especially from schools which are just starting this work or whenever a school has failed to do commendable project work.

A parent's voucher may prove of value, especially whenever it is impossible for the instructor to reach a pupil's project frequently. The following form, adopted from Bulletin 385, United States Department of Agriculture, will prove suggestive:

PARENT'S VOUCHER.

Name of pupil.....
Residence.....
Parent's name.....
Project.....
Dates.....

I hereby certify that has carried out the project in
(Name of pupil.)

..... in the manner described in his report; that he did all the work with such exceptions as are noted in his report.¹ His own labor necessary to the success of his project was hours; hired-man labor hours; horse-labor hours.

¹ His expense, not including his labor, was..... \$.....

¹ His income from all sources.....

His profit, disregarding his own time.....

His labor hours, at per hour.....

Net profit.....

The exhibited in connection with his report were from his
(Samples, animals, etc.)
own project, and it is fair to rank him on this basis.

¹ Itemized accounts to be given in written report.

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Remarks:
.....
Signed.....
Relationship.....
Accepted
....., Teacher.
Credit allowed Rank on project
..... Final rank in subject
.....

Sometimes a parent is unwilling or unable to assist the boy in any way, or may have no land available. School land and school flocks are found useful in such cases, or a neighbor may lease land for the purpose. Unless the parent is opposed to the project work it is best to have his signature even if the land is leased elsewhere. If he is opposed and will not cooperate, obtain the signature of a responsible and interested person who will cooperate.

INSTRUCTION IN SCHOOL AS RELATED TO HOME PROJECT WORK

The schoolroom instruction which may have a bearing on the home project work is of three different types: (a) The regular course in agriculture outlined for the given term; (b) the instruction and reference study preparatory to project work or arising from the current problems met in the projects; (c) the related subjects, which may include other courses in agriculture, farm shop work, science, etc.

The first two are almost entirely in the hands of the instructor himself, and the success of the course, as well as that of the project, depends on his adroit development of the work. Supervisors frequently complain that the teachers of related subjects are not inclined to provide valuable correlation. In the case of vocational departments or special schools it would seem to be within the jurisdiction of the State supervisor to insist that a department shall not be recognized unless the nonvocational and the related subjects are coordinated with the agriculture. It is certainly within the power of the principal or director of such schools to require such correlation and to provide for a system of reporting on correlations, as has been done in some few schools. The teacher of agriculture will in each case have to provide the other teachers with the information as to the work of his pupils, and it must be borne in mind that correlation is mutual.

THE COURSE AND THE PROJECT.

The phase of agriculture to be studied during a given year will usually determine the type of major projects to be selected by members of the class. The fact that there is to be practical work on projects should likewise determine to a large extent the arrangement

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of subject matter and school practicums during the year. Since the work on the home project must be seasonal, the study of the subject matter must likewise be made seasonal, anticipating the practice by a period only sufficient to allow the student to prepare for the necessary farm practice as it is learned in his course.

To this end, the topics in even the best of textbooks in agriculture will not be studied in the order given, but the instructor will outline his course from the seasonal point of view, and will select the chapters or topics in the textbooks and the bulletins which will provide the information needed. Especial emphasis should be laid on those phases of the subject which bear upon the projects under way. It is wise not to draw a well-defined line between the recitations in the regular course and the project study proper, which is developed in accordance with the needs of the project. The subject in the course of study being agronomy, the field crops grown on projects would determine relative emphasis in that course. School and home practicums which might be related to the project study and project work in corn production and might become necessary parts of the instruction requiring additional emphasis would include among others—

Testing seed corn.

Home mixing of fertilizers.

Terracing to control soil erosion.

Laying out a drainage plan for the field.

Practice in tile drainage on the field to be used for corn.

Such practicums and related instruction should not be considered separate projects, although a drainage project might be planned independently. The instruction related to the project would include many minor exercises such as the calibration of a corn planter or the construction and use of corn-drying racks. Some of this type of instruction should be given at the school, some on field trips with the class, and a part on the boy's farm in consultation about his project work.

Boys who had no corn projects would profit by the study and general discussion of corn growing, but the boy with a corn project would make a more detailed study of each problem which developed in connection with his own project.

Stated in another way, there are (a) certain general principles in agronomy which bear upon all plant growing projects, (b) several matters connected with corn growing which every pupil in the section should learn, and (c) several problems of major interest only to the boy who encounters them in his project work.

It will be agreed that both (a) and (b) should be incorporated in class study and discussion to be outlined in the course, while (c) will be best dealt with in personal or small group conferences.

An instructor may do well to tabulate his own plan of work along this line. The following suggestion may prove helpful:

Course in soils and crops, 1918.

General principles (entire class).	Separate crops (entire class).	Project problems (individual).
Soil conditions. Soil improvement. Manure for soil. Crop rotations. Value of legumes. Commercial fertilizers. Principles of breeding. Pollination. Tillage. Cultivation. Weed control, etc.	Corn: Seed selection. Testing seed corn. Using the planter, etc. Potatoes: Disinfecting seed. Cutting seed. Use of Bordeaux, and arsenates, etc.	Corn (John): Drain low spot. Get new seed. Plow deeper than last year, etc. Potatoes (H. and W.): Decide on variety. Find new sources of potato. Avoid field infested with scab. Terrace slopes. Locate spray apparatus and material, etc.

THE PROJECT STUDY.

If the pupil were able to anticipate each of the problems which may arise in connection with his project, the reference study to solve each of these questions would be sufficient project study and the instructor would merely guide him to the proper authorities. As a fact, many of the lessons which the boy learns best are the outcome of emergencies which he faces in his project and must look up at once to save his crop.

Since this is not, however, a logical plan, several types of project study outlines have been developed and in some schools the boy completes the study of the entire subject before he begins his project.

It appears, however, that if a pupil studies lettuce-growing in September and starts his project in March not much gain has been made over the traditional textbook method of instruction. Stereotyped forms of study outlines should not be put into the hands of the pupil to be followed step by step with notebook record of readings.

To a large extent the original study outlines should be kept in the hands of the instructor to be modified for each individual. The pupil should not be given a choice of project outlines, as these will not offer him the proper basis for a choice of project. It might be better to have outlined the project work and study in a brief form, the details of the study outline to be made later. The teacher should arrange in parallel columns the boy's project plan as originally laid out, closely related agricultural information and correlated materials which help to a better appreciation. These columns might be labeled (a) What must be done, (b) What must be learned, and (c) What it is well to learn. A sample outline is here given without detail and without attempt to make an exhaustive list of correlations.

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An improvement project—The profit from a dairy cow.

Project work plan.	Study involved.	Correlated material
Milk two or more cows for one year or more.	Sources of milk. Sanitary milking. Care of cows.	Sediment test of milk. Care of milk in the home.
Weigh milk at each milking and record on sheet in stable. Total each week and each month.	Proper use of the spring balance. Factors influencing variations in milk flow. Best methods of tabulating.	Daily, weekly, and monthly records of notable cows. Averages for herds and for the State.
Take samples of milk morning and evening twice each week. Observe cautions.	Natural separation of milk. Specific gravity of each part. Official methods of sampling.	Emulsions and their peculiarities.
Run separator or cool and store the milk as required. Test each cow's milk separately for butter-fat at least every two weeks at first, monthly later.	Commercial disposal of milk; making of milk products. Principles of centrifugal action. Sulphuric acid in this connection. Basis of computations.	Specific gravity of liquids. Bacteria in milk. Spread of disease by milk. Applications of centrifuge, drying machines, etc. Acids. Neutralizing.
Compute total butter-fat per cow. Compute total income at the market prices, by the day, week, and month.	Composition of milk. Percentage of each part. State or city standards for total solids; for butter-fat.	Milk as food. Value of each part. Relative value compared to other foods.
From weight of cow and daily production, compute a ration and vary until success is apparent.	Digestible nutrients of local feeds. Balancing a ration. Economic rations of home-grown feeds. Manurial value of feeds. Proper use of by-products.	Human foods. Sources of protein. Clover and other legumes.
Compute cost of rations, cost of care.	Value of skim-milk.	Comparison of cost of production of dairy products with cost of production of other products of domestic animals.
Credit cow with butter-fat, skim-milk, manure, etc., and find net income for whole period.		
Compare cows. Compare each with the points in score cards for judging.	Judging dairy cows. Observation trips. Famous cattle.	Types and breeds of cows.
Sell or exchange unprofitable cows.	Cattle markets. Pure-bred cattle associations.	Market quotations.

This project outline would serve as the basis for the pupil's study outline as well as for the teacher's instruction plan, each to be elaborated further.

THE PROJECT STUDY OUTLINE.

Study outlines of some sort are necessary for the guidance of the pupils. Caution is necessary, however, to avoid several common faults in the use of these.

1. Too voluminous outlines frequently lead to too much consideration of nonessentials or encourage pupils in wasting time on notebook work.

2. Stereotyped study outlines are little or no better than formal textbook study. Elasticity and individuality are required to meet the varying situations in projects. Pupils detect quickly the weaknesses in the uniform outlines.

3. Initiative on the part of the pupils may be discouraged by any outlines which do not train them to develop any part of the work.

It is especially desirable to teach the pupil how to look up his own problems in bulletins and books, as he will have no outlines to guide him in after years. He should also take some part in making the outline lest he imagine that the study questions cover all possible problems.

4. Outlines which are merely a substitute for textbooks should be discarded. The substitution of a question for a statement of facts does not provide a motive for the student even when in first or second person.

There should be frequent individual conferences with the pupil in which he should report on his problems during the progress of his project, and the instructor should use discretion as to whether each problem may best be taken up by the class as a whole or with the pupil alone, this being a question of relative values.

Since a project outline must naturally include many topics which will be developed in the course studied by the entire class, it would seem preferable to require the pupil to furnish the subdivisions of such parts of the outline with few, if any, suggestions from others. This is in a sense a review and, to quite an extent, a test as to how carefully he has covered the previous work.

As an example, consider that the class has studied and discussed the question of plowing, harrowing, and other steps in preparing the seed bed for crops in general. The boy with a corn project should, sometime before plowing is necessary, determine the specific steps necessary on his project under an appropriate section of his outline and should put into his notebook the plan which results from his study.

Such a main section of the outline may come from the teacher as a question, as "How will you prepare your seed bed?" or the boy may ask himself the question, expecting to question himself further as to each detail. On the other hand, if the boy has the motive for seeking the information it is as effective to present to him for study a bare outline heading as follows, using only such suggestions as are necessary to keep him on the right track. This will vary with the individual capacities of boys.

Preparing the seed bed for corn.

1. Manuring, liming, etc.
2. Plowing. When? Sod? How? Trash? Clean fields? Root system of corn as bearing on plowing.
3. Harrowing. Tools, time, method.
4. Last stages. Weed control. Tilth.

For such points as the class may not have discussed the pupil may need further direction, and especially in the matter of suitable references. The instructor should watch the progress of each boy

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in his project study lest he waste too much time, but should encourage the boy's initiative. Having the bulletins on the shelves arranged by subjects will make this method more practical and the boy acquires habits in reference study which he will need as a man.

In dealing with strictly new topics the instructor must provide more detailed outlines and should indicate the more valuable references. Otherwise he should not invite the feeling of irresponsibility on the part of the boy. Students resent the insinuation of childishness which seems to be hidden in too detailed outlines.

The following sections chosen from outlines used in some States will indicate some possible types of development of project study outlines.

TYPES OF OUTLINES FOR VARIOUS PROJECTS.

1. *Pea growing project.*¹—(Second person question form with details. References are omitted here.)

Guiding questions for planning this project.	Guiding questions for studying and understanding this project.
Plant how?.....	(1) Shall you plant by hand or with a seed sower? A. How should the seed sower be set for peas? B. How are the peas sown by hand? (2) Shall you soak the seed? (3) Shall your rows be straight? (4) Plant how deep and how far apart between rows and between plants? To what extent should size of seed, time of year, weather, and soil conditions control depth and distances? (5) Keep itemized record of cost of planting.
Cultivate how?.....	(1) Shall you cultivate peas with both horse and hand tools? (2) Keep items of cost of cultivation.
Shall you water?...	(1) What is "free" water? How far from the surface is the "free-water" level in your pea ground? (2) Is it ever advisable to water after sowing peas? (3) Why "never sprinkle?" When, how, and in what quantities should water be applied? (4) Keep accurate account of cost in time and equipment for watering.

This gives the point of view of the teacher guiding the boy.

2. *Potato growing project.*²—(First person question form detailed.)

- I. Shall I grow potatoes for my project?
- 1. Is this section adapted to potatoes?
 - 2. Is my soil suitable for growing potatoes?
 - 3. Can I control all pests and diseases which prevail in this district?
 - 4. Is there a good prospect for potatoes paying a profit this year?

¹ From Massachusetts State Board of Education Bulletin No. 28 (1918, No. 9), p. 86. Project Study Outlines for Vegetable Growing. Prepared under the direction of R. W. Stimson.
² U. S. Dept. Agr. Bul. 316 (1916), Home Projects in Secondary Agriculture, by H. P. Barrows, pp. 8 and 9.

II. What shall be my aim in potato production?

1. Shall I grow late potatoes for winter use?
2. Shall I grow early potatoes for the market?
3. Shall I grow potatoes for seed?
4. Shall I make a combination of the aims above?
5. To which is my soil best adapted?
6. Which offers the greatest prospect for returns?
7. Which will fit in best with my work at home and at school?

III. How shall I prepare my land?

1. Has the previous crop and treatment of the land left it in suitable condition?
2. What crop should I use to prepare the soil for a future potato crop?
3. When and how should barnyard manure be used for a crop of potatoes?
4. Can I afford to use commercial fertilizers on my potato land; if so, how much of what kind?
5. When shall I plow and how deep?
6. What other preparation is necessary?

With this form the boy is understood to have a motive and to be questioning himself.

3. *Vegetable Garden Outline.*¹—(Question and direction form combined. Detail not prominent.)

VI. Hotbed and cold frame construction.

1. State the object of a hotbed and of a cold frame.
2. Give the advantages of forcing vegetables under glass.
3. Is it advisable to force vegetables for your market?
4. How large a hotbed will be needed to grow plants for your garden?
5. What should be the size of the cold frame in proportion to the hotbed?
6. Describe the method of building a hotbed according to the following points:
 - (a) Size of standard hotbed sash.
 - (b) Depth of pit.
 - (c) Amount of material needed to build hotbed frame.
 - (d) Make a complete working drawing of the hotbed.
 - (e) Describe in detail the method of preparing horse manure for hotbed pit.
7. Give a complete bill of cost of the hotbed.
8. Describe the method of building a cold frame according to the following points:
 - (a) Size of standard cold-frame sash.
 - (b) Materials needed to build frame.
 - (c) Use keyed mortise and tenon for joining the parts of the frame together.
 - (d) Make a complete working drawing of the cold frame.
9. Give bill of cost.

VII. Seed sowing and care of hotbed.

1. Give specific directions for preparing the soil for the hotbed.
2. What seeds should be sown in the hotbed?
3. Make a diagram for hotbed planting.
4. What should be the average temperature of the hotbed?
5. Why should the sash be opened each day?
6. At what time of day should the sash be opened?
7. Describe the time and method for wetting the seedling in the hotbed.

In this form the suggestions provide guidance if the boy's interest provides the motive.

¹ Univ. State of N. Y., Bul. No. 624 (1916), *Agricultural Education in Secondary Schools*, prepared by L. S. Hawkins, pp. 29 to 30.

4. *Remodeling the chicken house.*¹—(A survey type outline in the second person.)

Shall you remodel your chicken house?

- 1. Compare your chicken house as to front view, interior arrangement, and construction, etc., with the drawings and diagrams of desirable chicken houses. Farmers' Bulletin 574.
- 2. How many chickens have you? What breed?.....
- 3. Estimate the square feet of floor space per hen.....
- 4. What kind of floor?..... Its condition.....
In what ways is it undesirable if any?.....
Use your own observation.
- 5. Estimate the cubic feet air space per hen.....
- 6. How is fresh air supplied?.....
- 7. Estimate the number of square feet of floor to each square foot of ventilating area.....
- 8. Estimate number of square feet of floor to each square foot of glass.....
.....
- 9. What is length of roosting space per hen?.....
Where are the nests located?.....
How arranged?..... What undesirable features have you noticed?.....
- 10. Number of hens per nest?..... Where are nests located?.....
Size?..... Arrangement?..... What objectionable features have you observed?.....
- 11. What is the location, size, and construction of feeding equipment?.....
..... Water supply?.....
- 12. What is condition and construction of walls and roof?.....
.....
- 13. Make drawings, label, and give dimensions showing:
(a) Cross-section view with roosts, nests, wall, and floor dimensions.
(b) Floor plan showing interior arrangement.
(c) Front view showing windows and ventilating area.
- 14. What essential features are lacking in your poultry house?.....
.....

What parts or features of your poultry house shall you remodel?.....

What kind of floor shall you use?.....

- 1. What are the essentials of a good floor?.....
- 2. What is the effect of a damp floor upon chickens?.....
- 3. When is a dirt floor satisfactory?.....
- 4. What are the usual disadvantages of a dirt floor?.....
- 5. How does water rise in a dirt floor?.....
- 6. What could you do to make a dirt floor the driest possible?.....
- 7. Will you use a dirt floor?.....
- 8. What are the advantages and disadvantages of a board floor?.....
- 9. What are the advantages and disadvantages of a concrete floor?.....
- 10. Compare the costs of different kinds of floors which you might use. (Secure information from lumber dealers, etc., and reference material.)

Give plans and methods for constructing the floor.

.....
.....
.....
.....

¹ Suggestions for Conducting Home Projects in Agriculture in Vermont. Mimeographed copy, p. 17.

6. The dairy calf.¹—(Outline in two parts—I. What the pupil should know. II. What the pupil should do.)

I. What the pupil should know (parts A to D omitted).

E. Feeding and management of the calf.

1. Feeding before birth.
2. Caring for the cow at time of calving.
3. Care of calf at birth.
4. Separating calf from cow.
5. Teaching the calf to drink.
6. Value of sanitation.
7. Quantity of feed required.
8. Changing feed.
9. Frequency and regularity of feeding.
10. Milk substitutes.
11. Home-mixed calf meal.
12. Roughage for calves.
13. Grain for calves.
14. Pasture for young calves.
15. Weaning the calf from milk feed.
16. Water requirement of calves.
17. Housing the dairy calf.
18. How to prevent horns.
19. Calf diseases.

- (a) Indigestion.
- (b) Scours.
- (c) White scours.
- (d) Colic.
- (e) Blackleg.
- (f) Pneumonia.

F. Feeding and management of young dairy stock.

1. Feeding from 6 months to 1 year of age.
2. Feeding from 1 to 2 years of age.
3. Cost of growing dairy heifers to 2 years of age.
4. Age of breed.
5. Time of year to breed.
6. The young bull.

G. How to keep records of all items of cost and income.

II. What the pupil should do.

A. The above and related topics should be studied in school.

B. Step by step as the topical study at school progresses the pupil should make practical use of the information in the actual management of dairy calves at home.

RECORD OF PROJECT STUDY.

The notebook required in connection with the project study should include in an orderly arrangement all the information which may be needed for the project work. It should be borne in mind that the notebook is for the pupil rather than for the instructor, and if properly made will be a compilation of information which may prove useful in after years.

¹Indiana State Board of Education; Educational Bulletin No. 27 (1917), Courses in Agriculture on the Home Project Basis. Prepared by Z. M. Smith, p. 128.

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If a pupil has practice in computing and mixing fertilizers, it is not wise to require the memorizing of the percentage of elements in each. It will be wise to put into the notebook tables covering some of the materials in common use and references to more detailed information. In like manner, a boy will have practice in making Bordeaux mixture and will record the ratios to be used under varying conditions.

The notebook should also include a description of existing conditions which bear upon the project with a statement of the plans to improve or to profit by any of these. Such a page from a student's notebook on a poultry project study follows:¹

Parts of poultry house to be remodeled are:

Floor, roosts, nests, dropping board, windows, and ventilating system.

The floor at present is dirt; it is low and nearly always wet; surface water runs in from the outside; it is 14 by 14 feet.

The nests are store boxes placed on ground. They are all sizes, some 2 feet deep.

The chickens roost on three 2 by 4 inch pieces, 8 feet long, placed on the side. There are 96 hens. They are crowded on the roosts and many roost on the sides of the nests. There is no dropping board.

There are two windows, each with four panes 10 by 14 inches. They are nailed in and do not open. There is no special place for ventilation. Farmers' Bulletin 574, 1 and 2 Lewis.

Plan to put in a concrete floor:

I plan to take out about 3 inches of the dirt floor. Hard cinders will then be tamped in. A 3-inch concrete floor will be put on top of this. I expect to use a bank run mixture of sand and gravel. I will use 1 part of cement to 6 parts of the mixture of sand and gravel. Bulletin No. 26, Concrete in the Country. Farmers' Bulletin 461, Farmers' Bulletin 574.

Plan for mixing concrete, etc.:

NOTE.—In the fall term this boy's chicken house was severely criticized by students of his class. After the chicken house was remodeled the students were again taken to see the chicken house as an excellent illustration of what could be done in remodeling an old building.

Some diagrams, tables, or valuable instructions may be clipped from papers, magazines, or catalogues and included in the notebook. Since new material of value may be found after the record is nearly complete, the loose-leaf notebook will permit insertion at the proper place. With proper precaution this style of notebook will prove superior as leaflets, lists of bulletins, and other related material may be added, and new lists may be substituted for old ones.

It is wise to have the boy begin here a habit of accumulating the information bearing on a particular line of farm work by the very same method he should use in later years. The most valuable features of notebooks may be sacrificed if the instructor places emphasis on the features which help him in inspecting and checking up on the work.

¹ Suggestions for Conducting Home Project in Agriculture in Vermont, p. 21. (Multigraphed manuscript.)

When the project is closed the boy should combine the reports of project work done, his financial and other accounts with his notebook to make a book of permanent value to him as a farmer. This aim must be kept constantly in view by both pupil and instructor, and the boy must never be allowed to feel that the notebook is for the purpose of satisfying the demands of the teacher or for the purpose of getting a good mark.

HOW LARGE PROJECTS?

This question might be answered by farm management labor records if the labor requirement did not vary so much in different sections. Growing an acre of corn in many sections requires approximately 80 man-hours of labor. Reliable records, however, show variations between 30 and 100 man-hours.

It is clear that if 80 hours are required to grow an acre of corn, there would not be twice the educational value in growing 2 acres of corn. It might be fair, however, to allow the pupil to carry on a field of corn large enough to equal about half the requirement for a year's project work. It might be best to obtain the other half by raising pigs to eat the corn or by growing a second crop, which would provide variety in experience.

The basis for determining the size of a project to be required will at first be obtained by estimates and by consulting such records of labor requirements as now exist. Each year, however, there should be added to the permanent files of the school the records of students who have kept careful accounts of their projects, and these will provide the more dependable basis for this purpose. The purpose of such credit should be to apportion properly school and home work, the credit or rank being incidental, except as an estimate that sufficient work has or has not been done in a satisfactory manner. It is desirable to indicate in some manner that the boy has mastered certain fundamentals and has acquired certain skill in connection with his project and to place this fact on record. A more complete discussion of this subject will be found in United States Department of Agriculture Bulletin No. 385 (1916), School Credit for Home Practice in Agriculture.

DETAILED PROJECT RECORDS AND REPORTS.

The boy should be required to keep itemized records of his project, including methods used, tools or machines used, cost of material, time spent, income, etc. These records will vary with different projects and should be justified in all cases. Needless accounting or that which does not appear to function in the success of the project will make the pupil disinclined to keep accounts voluntarily afterwards.

The important aim is to get the boy into the habit of keeping accounts for farm-management purposes and to lead him to depend on the accounts for the analysis of his business.

For one given type of projects there are advantages in uniform accounts, and the forms to be submitted to the instructor for the files of the schools should necessarily be uniform for any institution. Likewise, these project records which are to be forwarded to the State supervisor should be uniform throughout the State, but these will be summaries rather than the original accounts.

The original accounts should be models of the most convenient farm bookkeeping approved by farm management experts. These should be frequently submitted to the instructor for inspection and advice and at regular intervals the necessary data should be transcribed to the form used in reporting labor and expense to the school. The pupil should always retain one copy for his record book, one copy should be filed with the instructor, and, if required, one copy used for State inspection records.

There is much in favor of the diary form of original record. Besides the labor and financial items bearing on the project, there will be included a variety of items of varying degrees of importance. This information will not all be transferred to the account sheets or even figure in the final story of the project, but, if not forced upon the boy by the teacher, may represent his spontaneous reactions and be valuable to him personally.

The daily milk sheet of the dairy project should hang in the milk room or the stable, and the egg and feed records should be adjacent to the place where the eggs are gathered or the feed weighed. Some of these items may find their way into the diary or may be transferred directly to the summary forms.

While other more scientific forms of original record are to be found, the fact remains that the farmer neglects to use these regularly and the simple diary or "day-book" method is more likely to be kept up.¹

In any case, the chief aim is to get reliable data to fill weekly, monthly, or season forms from which we may determine profit and loss, also progress or improvement.

At the close of the project period or of a definite phase of the work a summarized and balanced statement up to that date is necessary. The following forms are suggestive of accounts and records to be used by the boy either at home or in reporting to the schools:

¹ See Farmers' Bulletin No. 782, The Use of a Diary for Farm Accounts.

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THE UNIVERSITY OF THE STATE OF NEW YORK, THE STATE DEPARTMENT OF EDUCATION, DIVISION OF AGRICULTURAL AND INDUSTRIAL EDUCATION.

SUMMARY AND FINANCIAL STATEMENT OF A POULTRY PROJECT.

From ———, 19——, to ———, 19——.

Pupil..... School.....
Address..... Number of birds.....
Variety.....

Month.	Feed consumed.			Cost of feed.				Eggs sold.		Fowls sold.		Labor.		
	Grain.	Mash.	All else.	Grain.	Mash.	All else.	Total.	Dozen.	Value.	Number.	Value.	Sell.	Man.	Horse.
	Lbs.	Lbs.		¢	¢	¢	¢		¢		¢			
January.....														
February.....														
March.....														
April.....														
May.....														
June.....														
July.....														
August.....														
September.....														
October.....														
November.....														
December.....														
Total.....														

RATIONS.

Date.	Corn.	Wheat.	Mixed grain.	Corn meal.	Wheat bran.	Wheat middings.	Meat scraps.	Mixed mash.	Green feed.	Shell.	Grt.	Litter.
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
.....												
.....												
.....												
.....												

SUMMARY.

Item.	Charges.	Credits.
Inventory.....		
Labor—self, man, and horse.....		
Feed.....		
Litter.....		
Fowls dead.....		
Disinfectants.....		
Interest, depreciation, etc.....		
Crates, boxes.....		
Eggs (hatching).....		
Chicks.....		
Cockerels.....		
Eggs (market).....		
Fowls (market).....		
Net profit.....		
Total.....		
Net profit per bird.....		

HOME PROJECT PHASE OF VOCATIONAL AGRICULTURAL EDUCATION. 29

THE TEXAS STATE BOARD FOR VOCATIONAL EDUCATION, IN COOPERATION WITH THE
FEDERAL BOARD FOR VOCATIONAL EDUCATION.

SUMMARY OF LABOR AND FINANCIAL STATEMENT.

(Fill out in duplicate.)

Of A Project.
(Crop.)

Pupil..... School.....
Address..... Area of crop.....acres.
Variety.....

Summary of labor.				Summary and financial statement.				
Operation.	Hours of labor.			Item.	Quan- tity.	Price.	Charges.	Credits.
	Self.	Man.	Horse.					
Clearing land.....								
Draining.....								
Measuring.....								
Plowing.....								
Terracing.....								
Harrowing.....								
Rolling.....								
Seed preparation.....								
Planting.....								
Weeding.....								
Thinning.....								
Spraying.....								
Cultivating.....								
Cutting.....								
Shocking.....								
Husking.....								
Pulling.....								
Digging.....								
Picking.....								
Grading.....								
Cleaning for market.....								
Marketing.....								
Miscellaneous.....								
Total.....								

COPY OF A PUPIL'S APPROVED INDIVIDUAL COW ACCOUNT.¹

Cow's name; weight pounds. Breed Registry number Born
Dropped last calf..... Dam's name and number..... Breed Age
..... Dairy Improvement Association. Sire's name Breed Register number

Cow's number Owner Address

Date.	Yield for month.			Yield to date.				Grain and roughage 1 month.										Cost.					Balance.			Pounds digestible nutrients in daily rations.		Nutritive ratio.	Remarks.	
	Pounds of milk.	Test.	Pounds of fat.	Pounds of milk.	Pounds of fat.	Price of 1 pound of milk.	Total value.	Gluten feed.	Mixed hay.	Dried corn fodder.	Wheat bran.	Gluten meal.	Dried beet pulp.	Cottonseed meal.	Pasturage.	Oat straw.	Linseed oil meal.	Corn fodder.	Grain.	Roughage.	Total.	1 quart of milk or 1 pound of fat.	Total cost to date.	Profit.	Loss.	Returns for \$1.	Protein.			Carbohydrates and fat.
1913-14.																														
October.....																														
November.....																														
December.....																														
January.....																														
February.....																														
March.....																														
April.....																														
May.....																														
June.....																														
July.....																														
August.....																														
September.....																														
Total.....																														

¹ Massachusetts State Board of Education, Bulletin No. 43, p. 68.

HOME PROJECT PHASE OF VOCATIONAL AGRICULTURAL EDUCATION. 31

Massachusetts pupil's approved "financial statement" on potato projects.

Date.	Transactions—1914, financial statement.		Hours.		Potatoes.	
			Man.	Horse.	Re- ceipts.	Ex- penses.
10 30	My labor.....	@\$0.25..	165½	.....	.....	\$41.31
10 31	Other man labor.....	@\$0.20..	169½	.....	.....	33.90
10 30	Horse labor.....	@\$0.10..	.....	232	.....	23.10
	Miscellaneous.....		.....	.....	.....	111.08
10 30	53½ bushels potatoes.....	@\$0.75..	.....	.....	\$40.13	.....
10 30	332½ bushels potatoes (unsorted).....	@\$0.50..	.....	.....	166.25	.....
10 30	80 bushels potatoes (small).....	@\$0.20..	.....	.....	16.00	.....
	Net profit.....		.....	.....	.....	12.99
	Total.....		.....	.....	222.38	222.38

Accomplishment record.

(To be filled by the instructor.)

Student, Class, Freshman.
Project, acre of corn. School year, 1918-19.

Things learned.	Date approved.	Skill acquired.	Date approved.
Computing fertilizer.....	Harvesting team.....	.....
Crop rotation plans.....	Breaking sod, two horses.....	.....
Judging seed corn.....	Using manure spreader.....	.....
Testing seed corn.....	Calibrating, corn planter.....	.....
Principles of pollination.....	Check row planting.....	.....

Approved at close of project. Date

.....
(Instructor.)

THE PROJECT REPORT.

At the close of any definite phase of the project the pupil should submit a statement of his project work in descriptive or narrative form, including methods used, problems encountered, adherence to or divergence from the original plan, and this, with the summarized labor and financial report, will constitute the report. In the case of a final report the parent's voucher should accompany it, and in each case the pupil should keep a copy of this report for a part of his record. This should include any photographs or other material pertinent to the record of the project.

If the project study notebook has been properly kept, this, with the accounts and the final report, will make a compilation of value to the pupil in after years. This aim must constantly be in the minds of the instructor in respect to accounts and reports as well as project study records. At the school should be kept a file of all important features of the projects, especially labor and cost records, with a complete photographic record of both individual and class work.

SUPERVISION OF PROJECTS.

The chief aim in supervising home projects is to encourage and assist the pupil so as to insure the success of the project, thus giving the boy the best kind of training in farming. One incidental but rather important aim is to secure the data needed for school records and for reports to the State supervisor. Another secondary aim is to give assistance to adults in the neighborhood whenever this is requested or to advise younger children who carry on junior project work. These three aims may be classified as instructional, inspection, and extension functions of such supervision.

INSTRUCTION ON THE FIELD.

Unless an instructor visits each project frequently a boy is inclined to drift into poor methods, due to the influence of poor practice around him or to a misinterpretation of directions. He also needs the encouraging stimulus which the instructor may bring. On these visits the instructor should ask the boy to explain what he has done since the last visit, demonstrating the method, if need be. He should then look for signs of harmful practice, of insects, disease, or other problems needing attention.

He should listen to the boy's own version of his difficulties, suggesting remedies or providing the proper references to authorities. He should inquire as to the methods planned for the immediate future and demonstrate, if need be, the proper way to handle any detail. He should make sure the boy is not forming wrong habits in handling tools or in other manipulation. Market conditions and transportation, special opportunities, and other current information should be brought to the student and discussed in their bearing on his project or the general interests of the home farm.

Before leaving the boy the instructor should advise the boy very carefully as to his work in the interval before the next visit. He should leave with the boy a written memorandum giving a brief outline of these instructions and should make note of any reading needed in this connection. This memorandum should be one copy of the triplicate blank mentioned under inspection.

INSPECTION OF PROJECTS.

The visit to the boy's project will serve to check and record the fact that the boy has done certain parts of his project work with a certain degree of excellence. This corresponds in a way to the record made at school of the boy's participation in laboratory or recitation work, and the system of crediting and ranking should have some relation to that used for other school records.

If this data is noted on the memorandum made on the boy's project, the second copy may be filed at school as a part of the school record and the third may be submitted to the State supervisor.

At the school these blanks serve to show to local officials the supervising activities of the instructor and also the progress of the project work. As a part of the school record, the blanks figure in the final estimate of credit and rank to be given the student for the course in agriculture.

The blanks sent to the State supervisor keep him informed both as to the work of the local instructor and as to the progress of the projects. With the use of carbon paper these triplicate blanks should not be burdensome to the instructor. The form here given is an adaptation of one which has been used.

Copy of this received by: of (Address.) (Pupil or other person visited or advised.)	Date,, 191... Hour, M.
	PROJECT:
	MEMO.:
	School:
	Agricultural instructor:

Diagram of local inspection memorandum blank. Exact size of slip when detached from stub, 4 by 6 inches, to fit stock filing case and index tab cards.¹

REPORTS FOR THE STATE SUPERVISOR.

At regular intervals, weekly or monthly, the instructor should submit a statement of all his activities, supervisory, extension or otherwise, and it is desirable to have a uniform blank for this pur-

¹ Massachusetts Board of Education Bulletin No. 72 (1916), Information relating to the Establishment and Administration of County Agricultural Schools and Agricultural Departments, p. 59.

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pose. One copy of this should be sent to the State supervisor and one should be filed at the school for reference. It is well that local school officials should review all the blanks and other records.

PRELIMINARY STATEMENT.

Name of vocational school: Lincoln County High School.
Location: West Chesterfield.
Vocational school year: 1918-19. Term: Spring.
Class year: Second. Number in class: 15 boys.
Subject matter planned: Field crops, with special emphasis on grains and crop rotations.

Name of student.	Age.	Size of farm.	Distance from school.	Probable project.
James Ray.....	19	160 acres.	3½ miles.	1 acre corn followed by wheat.
Etc.....				

.....
(Instructor in agriculture.)

Approved:
(Director of school.)
Date submitted
Date accepted

VOCATIONAL AGRICULTURAL INSTRUCTOR'S PRELIMINARY SURVEY.¹

[Applicants must show that they have land and equipment for home projects prior to approval of their admission. Substitutes for home projects, such as employment on approved farms, are sometimes accepted.]

Name of pupil.	Residence.	Mile to school.	Home farm.		Live stock.				Fruit trees.	Remarks on equipment.
			Land.	Buildings.	Horses.	Cattle.	Poultry.	Hogs.		
Chester E. Cole.....	Berlin.....	5	101 acres (20 wood)....	{ House, \$2,800..... Barn, \$1,500..... Miscellaneous, \$1,000..	2	9	150 hens.	1	200 apple..	All modern farm tools.
Ernest B. Coulson.....	.....do.....	5	33 acres (all tillage)....	{ House, \$3,500..... Barn, \$1,000..... Miscellaneous, \$250....	.....	5	40 hens..	.....	12 apple...	All farm tools.
Albert B. Cutler.....	Boylston.....	5	68 acres (all tillage)....	{ House, \$2,000..... Barn, \$1,000..... Miscellaneous, \$200....	3	46	70 hens..	12	75 apple...	Do.
Etc.....

¹ Massachusetts State Board of Education Bulletin No. 43 (1915), p. 64.

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THE TEXAS STATE BOARD FOR VOCATIONAL EDUCATION IN COOPERATION WITH THE
FEDERAL BOARD FOR VOCATIONAL EDUCATION.

PLAN FOR SUMMER WORK OF TEACHERS OF VOCATIONAL AGRICULTURE.

(Fill out in triplicate.)

The plans for vocational agriculture in Texas under the Smith-Hughes law, published in Bulletin 68 of the Department of Education, provides as follows: "All teachers of vocational agriculture must be employed on a twelve-month basis * * *. The supervisor in charge shall visit each project at least once a month for the purpose of directing and giving such advice and assistance as may be necessary."

To the State and Federal boards for vocational education:

GENTLEMEN: The board of trustees of school has a contract with teacher of vocational agriculture for the year, 19.., to, 19.., and submits the following outline of supervisory services to be required of said teacher during the summer of 19... ..
.....
Etc.....

.....
(President.)

.....
(Secretary.)

Approved:

.....
(State director of vocational agriculture.)

..... (Name of school.) (Teacher of vocational agriculture.)

Name of pupil.	Age.	Agricultural subjects studied.	Scope and variety of home project.
.....
.....
.....
Etc.....

THE TEXAS STATE BOARD FOR VOCATIONAL EDUCATION IN COOPERATION WITH THE
FEDERAL BOARD FOR VOCATIONAL EDUCATION.

MONTHLY REPORT OF TEACHER OF VOCATIONAL AGRICULTURE TO THE STATE AND
FEDERAL BOARDS FOR VOCATIONAL EDUCATION.

(Fill out in triplicate.)

GENTLEMEN: The following is an accurate statement of the vocational agricultural work done in this school during the months of, 19...

(Signed)

.....
(Teacher of vocational agriculture.)

Approved:

.....
(State director of vocational agriculture.)

Suggestions:

1. Make the statement of the lesson specific in order that the scope of the work for each day may be clearly defined.
2. Under "Method" indicate—
 - (a) Recitations, lectures, and other exercises in which materials, apparatus, and equipment are not used—Rec.
 - (b) Supervised study—S. S.
 - (c) Reports—Rep.

HOME PROJECT PHASE OF VOCATIONAL AGRICULTURAL EDUCATION. 37

- (d) Individual or group laboratory activities in which materials, apparatus, or equipment are used by individual pupils or small groups of pupils—Lab.
- (e) Demonstrations by the teacher or other individuals in which materials, apparatus, and equipment are used—Dem.
- (f) Field work—Field.
- (g) When the period is divided between the above methods, indicate the approximate time ratio, for example—

1	2
Rec.	Dem.

3. **Make references specific and list only the more important ones.** When referring to the text, give the name at least one each month.

Date.	Lesson.	Pages in textbook.
.....
.....
.....
Etc.....

Method.	References.
.....
.....
Etc.....

THE UNIVERSITY OF THE STATE OF NEW YORK, THE STATE DEPARTMENT OF
EDUCATION, DIVISION OF AGRICULTURAL AND INDUSTRIAL EDUCATION.

FINAL STATEMENT OF HOME PROJECTS.

John H. FINLEY,
President of the University, Albany, N. Y.

The following is an accurate statement of the home project work done under the supervision of, teacher of agriculture in school during the year 19 -19 . There is on record in this school a detailed account of each project, including all data and summary of the work done by the teacher of agriculture.

....., *Principal.*

Approved:

.....
Specialist in Agricultural Education

Name of school..... Teacher of agriculture.....

[illegible]

Report of Harwich Agricultural School,¹ Harwich, Mass., 1914.

Name.	Age.	Project.	Net profit.	Labor.	Other earnings.	Total.
H. Atkins.....	18	$\frac{1}{2}$ -acre garden, few hens.....	\$147.73	\$23.50	\$182.60	\$353.83
H. Bearse.....	20	$\frac{1}{2}$ -acre garden, 27 hens.....	237.62	53.35	337.06	628.03
S. Cahoon.....	17	$\frac{1}{2}$ -acre garden, 20 hens.....	100.84	.....	147.40	248.24
W. Clark.....	17	Garden.....	97.36	.....	81.00	178.36
O. Nickerson.....	18	Garden, 65 hens.....	473.01	.....	228.00	701.01
E. Newcomb.....	15	$\frac{1}{2}$ -acre garden.....	44.73	.....	137.10	181.83
H. Hopkins.....	15	$\frac{1}{2}$ -acre garden, 20 hens.....	172.39	.....	19.65	192.04
R. Lopes.....	14	$\frac{1}{2}$ -acre garden.....	24.13	.....	59.20	83.33
J. Ramos.....	14	$\frac{1}{2}$ -acre garden.....	35.13	.....	37.05	72.18
R. Williams.....	16	Garden—hens.....	611.98	.....	177.00	788.98
			2,036.08	.....	.....	3,427.84

¹ A financial summary for the State supervisor.

EXTENSION PHASES OF SUPERVISION.

In the absence of a definite agreement, the instructor should avoid entering the field of the county agent. It will, however, be impossible to visit the boy's home farm without frequently being called upon to assist the parents and even the neighbors. He must also participate in public affairs as do other teachers, and the junior project workers of the school will look to him for advice. His discretion should decide whether a matter is within his jurisdiction or not.

It will frequently occur that the projects are widely scattered and at the same time the county agent's work is scattered to such an extent that by cooperation the boys may be visited more frequently at their homes and the farmers may receive more prompt attention. Any such agreement should be reported to the State supervisor and these extension activities should be reported on the monthly blank. In no case, however, should the teacher fail to visit any boy occasionally because the county agent may have visited the boy under the agreement.

Whenever the area to be covered by the instructor is fairly small, he should not give up any of his visits to his boys, but he may within that limited area carry on certain extension work under an agreement. The memorandum between the States Relations Service and the Federal Board for Vocational Education on this point is added to this bulletin as a supplement.

It is frequently possible for the county agent and the instructor in agriculture to unite in staging a demonstration related to some project work and often on the farm of one of the boys. Spraying, pruning, poultry killing, and marketing are among the demonstrations which have been handled in this way.

MEMORANDUM ON INSTRUCTION IN AGRICULTURE IN VOCATIONAL SCHOOLS AND EXTENSION WORK IN AGRICULTURE.

In order that those who are concerned with the administration of agricultural extension work and those who are concerned with the administration of vocational agricultural instruction may cooperate for the purpose of assisting in securing for this country an effective system of agriculture, the following statements are made.

EXTENSION WORK IN AGRICULTURE.

The United States Department of Agriculture, in cooperation with the land-grant colleges, has organized an agricultural extension system which extends throughout the United States. This has been done in accordance with a series of acts of Congress authorizing the establishment of such work and making appropriations therefor. This extension work consists of practical demonstrations, and the dissemination of information among men, women, and children through the personal work of county agents, home demonstration agents, boys' and girls' club workers, and others. This work covers the various branches of agriculture and home economics, including marketing and rural organization. It is supplemented by the widespread distribution of publications of the United States Department of Agriculture, the experiment stations, the agricultural colleges, and State departments of agriculture. The instruction and information used in this system of popular education is based chiefly on the work of the United States Department of Agriculture, the State agricultural colleges, and the experiment stations.

This extension work is not a systematic course of instruction but deals with problems of practice and business on the farm, in the home, or in the rural community. This is expressed in the following quotation from the Smith-Lever Act: "To aid in diffusing among the people of the United States useful and practical information on subjects relating to agriculture and home economics and to encourage the application of the same."

As the extension system becomes general and settles down in any community, it deals more and more with special problems of the farm and rural community rather than with the details of practice with which the farming people are generally familiar. Backed by the research system of agricultural colleges and the United States Department of Agriculture it brings to the people the new things which have been found worthy of broad trial in actual practice.

VOCATIONAL AGRICULTURAL INSTRUCTION.

The creation of the Federal Board for Vocational Education and a State board for vocational education in each State, under the provisions of an act of the sixty-fourth Congress, approved February 23,

1917, makes possible a Nation-wide organization for the administration of vocational education. The act carries an appropriation for salaries of teachers, supervisors, and directors of agricultural subjects. The money so appropriated is to reimburse schools for expenditures for salaries of teachers to carry on instruction in vocational agriculture or for the salaries of supervisors of such instruction.

Certain standards must be set up by the State board and approved by the Federal board for schools in which these Federal funds are to be used. These standards include qualifications of teachers, minimum amount for maintenance, the minimum plant and equipment, and courses of study. In case any of the fund is to be used for salaries of supervisors or directors, a plan of supervision for the State must be set up by the State board with the approval of the Federal board.

This act makes provision then for a course of systematic instruction in agriculture carried on in schools and classes under a definite plan of cooperation between a State board and the Federal board. This systematic instruction in agriculture, however, under the terms of the act must in every case include at least six months of supervised practical work.

RELATIONSHIPS.

In many counties of the various States there will be the cooperative agricultural extension system conducted by the State agricultural college in cooperation with the United States Department of Agriculture and the county under the provisions of the Smith-Lever Extension Act and under other Federal and State legislation. There will also be vocational agricultural instruction carried on by the State board for vocational education in cooperation with the Federal Board for Vocational Education and the county or the local school district under the provisions of the Smith-Hughes Act. Both the extension service and the vocational instruction will deal with both adults and children.

In each State there is a State director of agricultural extension service and an executive officer of the State board for vocational education. It is suggested that these two officials determine upon a plan of cooperation for the State based upon the following general policies or principles:

1. It is to be understood that all agricultural extension work should be administered by those in charge of extension activities in the State and that all vocational educational in agriculture should be administered by those in charge of the vocational schools of the State.

2. That all extension work with adults done by teachers in vocational schools be in accordance with the plans of the extension system for the State, and in cooperation with the agent who is in charge of the administration of the extension work in the county.

3. That in counties having vocational schools of agriculture the extension service will conduct its extension work in agriculture with children chiefly through the organization of clubs for the carrying on of definite pieces of work for the improvement of agricultural practice. The practical agricultural work of the schools will chiefly consist of home project work by the students as a part of the systematic practical instruction provided for in the Smith-Hughes Act. It is advised that in such counties a cooperative agreement be made between the extension authorities and the school authorities whereby it will be arranged for the teachers of agriculture to take part in the extension activities with the children within the territory of the school and that such territory be set forth in the agreement.

4. That in every case care be taken to see that work which is supported by Federal funds under any of the aforementioned acts will not in any way duplicate or overlap work being carried on in that same community when that work is supported in any part from another Federal fund.

Approved February 15, 1918, by joint committee of Department of Agriculture and Federal Board for Vocational Education.

TYPICAL PUBLICATIONS DEALING WITH THE TEACHING OF AGRICULTURE AND INVOLVING THE HOME PROJECT METHOD.

- Agricultural Education in Secondary Schools, L. S. Hawkins (Univ. State N. Y. Bul. 624 (1916), pp. 87, pls. 29, fig. 1).
- Courses in Agriculture on the Home Project Basis (Indiana Bd. Ed., Ed. Bul. 27 (1917), pp. 395, fig. 1).
- Supervised Home Project Work, Z. M. Smith (Indiana Bd. Ed., Ed. Bul. 19 (1917), pp. 44, figs. 24).
- Agricultural Instruction in Secondary Schools (U. S. Bur. Ed. Bul., 1913, No. 14 (Whole No. 522)).
- The Massachusetts Home Project Plan of Vocational Agricultural Education, R. W. Stimson (U. S. Bur. Ed. Bul., 1914, No. 8 (Whole No. 579), pp. 104, pls. 6).
- Agricultural Teaching (U. S. Bur. Ed. Bul., 1914, No. 27 (Whole No. 601), pp. 87).
- The Home Project as the Center vs. the Home Project as the Outgrowth of Agricultural Instruction, C. G. Selvig (Nat. Soc. Prom. Indus. Ed. Bul. 22 (1916), pp. 306-311).
- Plans and Records of Home Project Instruction, L. S. Hawkins (Nat. Soc. Prom. Indus. Ed. Bul. 22 (1916), pp. 312-324).
- Home Projects in Agriculture for Michigan High Schools and School Credits, W. H. French (Mich. Agr. Col., Dept. Agr. Bul. 17 (1916), pp. 15, fig. 1).
- Agricultural Project Study, R. W. Stimson (Bul. Bd. Ed. Mass., 1912, No. 4 (Whole No. 8), pp. 38).
- Project Study Outlines for Vegetable Growing (Bul. Bd. Ed. Mass., 1913, No. 9 (Whole No. 28), pp. 127).
- Information Relating to the Establishment and Administration of County Agricultural Schools and Agricultural Departments (Bul. Bd. Ed. Mass., 1916, No. 23 (Whole No. 72), pp. 80).
- Practical Agriculture in Texas Schools Through School, Home, and Community, J. D. Blackwell (Agr. and Mech. Col. Tex. Ext. Serv. Bul. 37 (1917), pp. 95, figs. 19).
- Agriculture in the High School: A Manual for the High Schools of Wisconsin, H. N. Goddard and J. A. James (Madison, Wis.: Dept. Pub. Instr., 1917, pp. 191, figs. 24).
- A Study of Organization and Method of the Course of Study in Agriculture in Secondary Schools, T. H. Eaton (Teachers' Col., Columbia Univ., Contributions to Ed., No. 86 (1917), pp. 183).
- Home Projects in Secondary Courses in Agriculture, H. P. Barrows (U. S. Dept. Agr. Bul. 346 (1916), pp. 20).
- School Credit for Home Practice in Agriculture, F. E. Heald (U. S. Dept. Agr. Bul. 385 (1916), pp. 27).
- The Use of Land in Teaching Agriculture in Secondary Schools, E. Merritt (U. S. Dept. Agr. Bul. 213 (1915), pp. 12).
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Annual Report for 1917.

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Bulletin No. 1. Statement of Policies.

*Bulletin No. 2. Training Conscripted Men for Service as Radio and Buzzer Operators in the United States Army (International Code).

Bulletin No. 3. Emergency Training in Shipbuilding—Evening and Part-Time Classes for Shipyard Workers.

*Bulletin No. 4. Mechanical and Technical Training for Conscripted Men (Air Division, U. S. Signal Corps).

Bulletin No. 5. Vocational Rehabilitation of Disabled Soldiers and Sailors.

Bulletin No. 6. Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors.

*Bulletin No. 7. Emergency War Training for Motor-Truck Drivers and Chauffeurs.

*Bulletin No. 8. Emergency War Training for Machine-Shop Occupations, Blacksmithing, Sheet-Metal Working, and Pipe Fitting.

*Bulletin No. 9. Emergency War Training for Electricians, Telephone Repairmen, Linemen, and Cable Splicers.

*Bulletin No. 10. Emergency War Training for Gas-Engine, Motor-Car, and Motor-Cycle Repairmen.

*Bulletin No. 11. Emergency War Training for Oxy-Acetylene Welders.

*Bulletin No. 12. Emergency War Training for Airplane Mechanics—Engine Repairmen, Woodworkers, Riggers, and Sheet-Metal Workers.

Bulletin No. 13. (Agricultural Series No. 1.) Agricultural Education—Organization and Administration.

Bulletin No. 14. (Agricultural Series No. 2.) Reference Material for Vocational Agricultural Instruction.

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Bulletin No. 17. (Trade and Industrial Series No. 1.) Trade and Industrial Education—Organization and Administration.

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Bulletin No. 21. (Agricultural Series No. 3.) The Home Project as a Phase of Vocational Agricultural Education.

All communications should be addressed to the
Federal Board for Vocational Education, Washington, D. C.

* Emergency war training for conscripted and enlisted men.



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BULLETIN No. 22

**COMMERCIAL EDUCATION
SERIES No. 1**

RETAIL SELLING

▼
**ISSUED BY THE
FEDERAL BOARD FOR VOCATIONAL EDUCATION
WASHINGTON**

OCTOBER, 1918

**WASHINGTON
GOVERNMENT PRINTING OFFICE
1918**

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FOREWORD.

The department store presents the same general problems in the proper selection, training, and promotion of its working force as do all other lines of business. Employers everywhere are coming to see that as a sound business procedure the careful conservation of employees is not only necessary but the wisest of all business policies.

Experience shows that success in the handling of a working force depends upon the extent to which these steps are taken effectively: There must be a careful selection of prospective employees for entrance upon occupations. They must be inducted into the work under careful supervision and direction. Some scheme of training must be provided, either before their entrance upon the work or soon after they have entered upon the discharge of the duties of the business. In some way a system needs to be established by which the progress and efficiency of these employees may be ascertained in order to make adjustments in employment, reward superior work, and retain and promote those who are capable of more responsible duties.

Throughout the country efforts have been made to establish systems of testing, instructing, and rewarding employees, so as to secure good work and loyal service. The author of this bulletin has been a pioneer in the preparation of young people for retail selling in department stores and in the preparation of teachers for such training. Necessarily, her investigations and her experience in conducting training classes has brought her work into close touch, not only with the training of employees, but with all the other factors involved in the preparation, selection, retention, and promotion of a retail selling force, all of which are discussed to a greater or lesser extent by the bulletin.

The author of the bulletin is Mrs. Lucinda W. Prince, head of "The Prince School of Education for Store Service," Boston. Acknowledgment is made of the valuable assistance of Miss Isabel Craig Bacon and Miss Helen Rich Norton who cooperated with Mrs. Prince in the preparation of the material. It represents the ripened experience of almost two decades of effort in training for retail salesmanship, which has met with the hearty appreciation of large numbers of merchants throughout the United States, and of educators generally.

Readers will find in the bulletin information and suggestions with regard to methods of training for retail selling, an inspiring description of the possibilities of employment for an important service with good returns, and convincing data with regard to the ways in which training can be made the core of a wise scheme of selecting, preparing, retaining, and promoting ambitious young people in a line of service and employment which affords large possibilities.

Particular attention is called to the ways in which the public schools of a community, particularly the high school, may cooperate with stores in the preparation of promising young people for retail selling as one of the most attractive lines of commercial employment.

C. A. PROSSER,
Director.

RETAIL SELLING.

INTRODUCTION.

This bulletin deals with that type of commercial education which has to do with training young people for the vocation of retail selling. It describes the great necessity for this kind of training, sets forth a definite plan for its development in retail centers, and provides for the special training of teachers necessary to carry on this work.

No attempt is made to cover training for what may be called "outside selling," but it is the purpose of the Federal Board for Vocational Education to deal with this phase of salesmanship in a subsequent bulletin. The following subjects also are among those that may be taken up in later publications: Training for clerical, accounting, stenographic, and machine-operating commercial service; the organization and conduct of evening-school commercial courses; and various types of part-time instruction for vocations connected with the distributive side of business.

The latest figures on the subject show that many more people are engaged in the retail selling occupations than are engaged in the office end of the business. For many years office workers have been successfully trained by public and private schools, but it is only recently and in a relatively few cities that any systematic training for retail selling has been attempted.

The experimental work done in Boston was the forerunner of a nation-wide movement to secure for other cities the kind of training that has proved so helpful to the Boston merchants. Education of those already engaged in retail selling was all that was contemplated at the outset, but the success of efforts in this direction soon led to the establishment of cooperative courses in high schools for the training of young people for service in retail business.¹

In this bulletin, for the first time, full information regarding the organization and conduct of such courses as a part of the work of a well-organized commercial department is made available for all school authorities who wish to meet the great demand for such training that has developed during the past few years.

¹ See Department Store Education, by Helen Rich Norton, U. S. Bureau of Education bulletin 1917, No. 9.

PURPOSES OF THE BULLETIN.

Stated briefly, the main purposes of this bulletin are to make available for the entire country information that will enable boards of education and merchants to establish courses of study in high schools and stores for the training of young people for the retail selling vocation; to point out the need for teacher-training courses for this type of education, and to give a definite plan for the establishment of such courses; and to aid in the establishment of part-time courses in retail selling and merchandise for those who have already become identified with the retail business with inadequate training for their life work. Incidentally the bulletin will indicate to pupils and parents the opportunities that are open to trained sales people.

In issuing this bulletin the Federal Board for Vocational Education hopes not only to stimulate interest in the establishment of retail selling courses in the high schools of the country, but to give personal aid to those school authorities who, seeing the need for such courses, call for help in their organization and operation.

The National Retail Dry Goods Association is interested in this important educational movement and through them and local retail organizations the Federal Board is in a position to reach local stores in many communities and secure the necessary cooperation of influential retail merchants.

Any school board that wishes to organize a course of training for retail selling is invited to call upon the Federal Board for Vocational Education for any help that may be desired. It is hoped that many cities will accept this invitation, and thus meet the needs of a large group of commercial workers for whom no adequate training has been given in the past.

ESTABLISHMENT OF RETAIL SELLING COURSES IN PUBLIC SCHOOLS.

It is significant that the experimental salesmanship school in Boston, when still in its pioneer days, won the support of merchants and later led to the extension of the work to the public schools. Not only in Boston but in many other cities where similar courses have been started it has been the merchants who have taken the lead. It was their demand for teachers to have the direction of educational work in their stores that led to the organization of teachers' training classes. Even before the State introduced continuation schools the various merchants were willing and glad to give the time for education in stores to as many classes as could be handled by the number of trained teachers available.

The high school, as we all know, was first established to give preparation for college to boys. Later girls were admitted, and about

30 years ago commercial courses were introduced. Many pupils left and are still leaving the grades because of their interest in something to do. We must admit that the high-school course, with the exception of the commercial course, has been arranged largely for the benefit of those who are going to college. The commercial course of the past has usually meant preparation for office work. Slowly but surely, especially since the surveys made by the National Society for Vocational Education were published, leaders in this field have come to recognize that training for retail selling must be included if we are going to fit our education to the needs of our boys and girls instead of insisting that all must fit into the courses outlined some years ago.

In the large cities, especially in the last 25 years, department stores have developed. Later many specialty stores, shoe stores, grocery stores, ready-to-wear clothing stores for men, women, and children have been added.

Too often in the past, boys and girls who left school to go into some wage-earning industry have drifted into any occupation to which they were led by chance; and in large cities, not primarily manufacturing cities, reports show that more have gone into stores than into any other occupation. A larger percentage of boys and girls from commercial courses are in selling positions than are in office positions; yet all these schools offer preparation for office positions but not for selling positions.

Enough has already been done to demonstrate that courses in retail selling have educational value comparable with any other high-school course, especially when the practice work in stores is a required part of the work. The stores are the laboratory and furnish untold opportunity for an understanding of business; and the school, with a properly trained teacher, teaches, advises, and directs these boys and girls not merely how to get positions but how to hold them when secured.

Preparation for retail selling is giving this occupation the status it should have, and is helping to remove the prejudice against it on the part of parents, educators, and pupils. It is not strange that those who are uninitiated in the progressive methods of stores to-day should have to be convinced that training for retail selling is not only a legitimate course for high schools but that it is also a valuable educative course for training young people, who will be the customers of the future, to be intelligent, discriminating purchasing agents for themselves and their homes.

NEED FOR TRAINING FOR RETAIL SELLING.

In order to get the most out of their resources, merchants are realizing that some scientific analysis of the business of selling is

quite as important as is the scientific analysis of the problems of production and manufacture.

The retailer's function is to provide merchandise that is wanted, at the time it is needed, at a price that seems fair to the customer. Our retail stores are the great service centers for the consuming public, which demands an increasingly high grade of service.

We have many types of stores and methods of retail distribution: First, those that come in direct contact with customers, such as department stores, specialty shops, dry goods, grocery stores, etc.; second, those that come in indirect contact with customers, such as mail-order houses, telephone shopping houses, etc.

The retailer usually decides upon the part of the community which he wishes to serve, locates his store, and regulates his merchandise accordingly. He consistently tries to serve his patrons, whether it be in the small field, in the community field of a larger city, in the whole city, or in the city and its environs.

In the past, whatever his field, the merchant has spent most of his energy on the merchandise side of his business. The large department stores have developed very quickly. With the competition of later years, more attention has had to be given to methods of doing business. As the margin of profit has continued to decrease, the merchant has been more inclined to improve these methods, and this has led to special study of organization and an awakening to the great importance of the personnel.

Progress in retailing has been retarded because of lack of attention to proper organization. Any study of the organization of a department store must show the important place which the sales people occupy. Too often the merchants themselves and the public think of the executives as being the all-important part of the organization and wholly underestimate the importance of the sales force.

A well-known authority on matters of organization has said: "A whole department store is nothing but each individual sales person in front of the merchandise, with one particular piece of merchandise in her hand, discussing it with the customer. Every other activity of the store is legitimate in so far as it centers at that point and illegitimate in so far as it does not." This high conception of her calling is an inspiration to the sales person and gives her some idea of responsibility and her relation to all the other workers.

REDUCING THE LABOR TURNOVER.

Since so little attention has been paid in the past to the personnel, the employing of the right people has been given very little consideration. More and more progressive employers everywhere are coming to realize that right selection is the first essential in building up an efficient, permanent organization.

The table on next page will show the facts in regard to the labor turnover of one of the leading stores in the country.

Some merchants do not like to face such facts and try to deceive themselves as to the true conditions; but it is encouraging that more and more they, too, want to know things as they are, even if the truth be unpleasant. This study of the labor turnover in a large department store reveals something that will be of lasting benefit to the store. It shows the turnover to be 100 per cent in one year; that is, as many employees left in one year as there are people employed normally in that store. Until this study was made no one would have believed such a statement. It led the management to serious consideration of the conditions, with the following results:

First, a plan for the more careful selection of employees was put into operation; second, training courses with careful follow-up work for employees were organized; third, an understanding on the part of the employee of promotional possibilities was assured through careful educational work; fourth, by an interview every endeavor was made to adjust all difficulties, if employee wished to leave.

It is significant to note that the largest number of people left that store without giving reasons. This excessive, but not uncommon, labor turnover was a financial and economic waste beyond computation.

Another store, which gives training to new people, has made a careful study of this problem and has shown that each new sales person costs a store \$200. This is believed to be a conservative figure. Reckoning on this basis, with a turnover of 100 per cent, will clearly demonstrate the economy, to say nothing of the efficiency, of a well-selected force.

The appalling economic waste caused by the enormous labor turnover in our retail establishments will be eliminated only through the working out of plans which will make for permanency in organization. This has brought merchants to realize the need for a higher grade of employee, a well-defined classification of positions, a definite promotional plan, and a proper recognition of service by a satisfactory wage scale. There is no better asset to a business concern than a group of loyal, happy, efficient workers.

In the belief that no such permanent force can be built up and maintained without adequate training facilities the merchant has become interested in training courses which will prepare boys and girls for store work. He not only welcomes the organization of high-school retail selling courses that mean a better type of beginner, but also for the development of material within the organization, he has established departments of education and training in his store. He has gladly cooperated in the organization of part-time classes for older workers in schools outside the store.

LABOR TURNOVER IN A REPRESENTATIVE DEPARTMENT STORE.

Number of employees:			
Aug. 2, 1916.....	317	Normal :	1,000
Mar. 16, 1916 (normal number).....	1,000	Loss by :	300
July 31, 1916.....	941	Loss by :	610
		Total loss.....	1,000

LABOR TURNOVER, 100 PER CENT.

WAGES.

Competition with other lines of industry, the high cost of living, and many local causes are bringing about a study of the problem with readjustment of wages. Some of the leading merchants of the country who have been studying this problem and have anticipated this have already raised wages, and in some of the larger centers State legislation has established a minimum wage considerably in advance of the old wage. Commissions, bonuses, and automatic increases are some of the various ways in which merchants are trying to meet this problem to-day.

Where the proper minimum wage has been established, either by legislation or by a sense of fairness, it has been necessary to have a force really earning such wages; otherwise the merchant could not carry on his business with profit. This has made it necessary to train young people for store work and also to train those who are already employed.

Not very many years ago young workers entered the stores from the grammar school. Now the tendency is growing rapidly to prefer at least a high-school graduate. Greater maturity and better education make for the greater efficiency which justify a higher wage. Merchants are coming to see that a smaller group of people carefully selected for their job and well trained along the lines of their work are a much better business investment, even at a higher wage than the larger untrained group upon the low-wage scale which prevailed a few years ago.

Another important consideration that has led the merchant to favor training for retail selling is that such training tends to eliminate the many costly errors. The following card from a leading store in the Middle West will show how one store takes care of these errors:

Name Sec. Date

[illegible]

At a glance the educational director can see just what errors are being made and whether or not they are being reduced. All the checks on which errors are made are given to the educational director. At first the store was reluctant to give up these checks, because they are the only record which the store has to account for the business it carries on. Confidence has to be established in the audit and delivery departments and in other places throughout the store. At the present time, in this particular store, the audit department and the billing and shipping department both for city deliveries and for out-of-town deliveries are turned over to the educational department.

It has been figured by that store that every one of such errors represents a minimum cost of 25 cents to the audit or billing department to get the checks straightened out and sent to the customer. That amount does not include the loss entailed through the loss of dissatisfied customers.

At the present time, that store has been able to show an economy of \$15 per day through the reduction of errors by proper training. This saving is tangible evidence to the merchant who demands proof that an educational department is worth dollars and cents to his store. The educational director accomplishes this result by going to each individual making an error and giving training where needed so that the same error need not be made again.

Not only are sales people trained, but also those employed in the audit department sorting checks are shown their relation to all other departments and given such training in the details of their work as is required for efficiency in handling their tasks. For instance, a girl who knows what "Department 19" means in actual merchandise, is far more intelligent in sorting her checks. A course of study has been prepared for these workers that can be covered in four or five lessons. They are taken through the store, so that they may know what has happened at every step in the making of the check before they get it and what happens to the check after it leaves their hands.

In the delivery department the same plan of education is followed. Delivery men are taken through the store, so that they may know their work and its relation to the work of others better. This has increased their interest and their efficiency. In case of error, the delivery man knows and understands the necessary procedure to get it quickly corrected. Furthermore, many errors are caught by the delivery men so trained and prevented from reaching customers.

The following figures taken from the records of another store are interesting in connection with error reduction as a result of training. In September, the month in which the training began, there were

668; in October, 301; in November, 203. In the shipping room of the same store in December, 1916, when no training was being given, there were 1,000 wrong addresses. In December, 1917, there were only 120. On the New Year's deliveries there were only 2 wrong addresses on about 500 packages.

OPPORTUNITIES IN RETAIL BUSINESS.

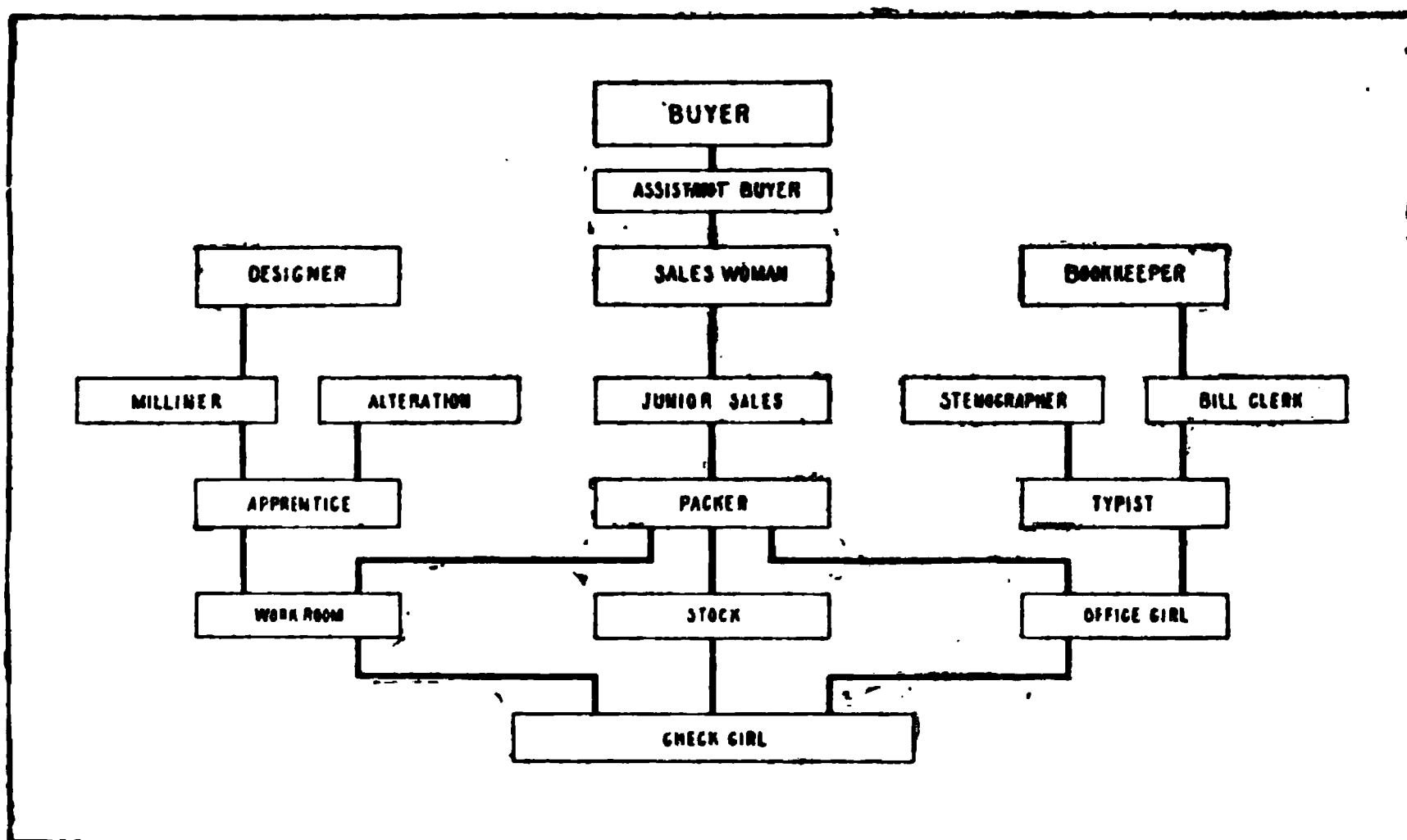
Few people realize the number and variety of positions in the field of retail distribution. The opportunities for advancement are practically unlimited. In most large stores the organization is divided into four large departments—the financial, merchandise, publicity, and personnel. In a small store these are handled by one manager. In such stores the problems are far more simple than they are in the larger stores, where an executive is needed for the head of each of the four departments.

The tendency to cooperation and consolidation, as shown in the chain stores, indicates the growing necessity for great economy in selling. To the person interested in the retail business, this modern trend means greater opportunity than ever before for one trained in all of its many phases. Executives are needed in increasing numbers to handle the managerial positions that exist under this new form of organization in addition to those already required for the department stores. In other words, as will be explained and illustrated elsewhere in this bulletin, training for success in retailing means preparation for attractive opportunities equal to those that are to be found in any other field.

PROMOTION.

The beginning positions in a store for a girl are usually those of inspector, cashier, stock girl, marker, or office clerk. From these positions she may advance to be sales person, head of stock, or assistant buyer. On the service side, she may be advanced from a stock or office position to that of floor clerk or assistant to the floor manager; and from that to floor manager or division superintendent, a position which many women are filling far more acceptably than men have in the past. The days of the old floorwalker are gone, and in his place we have a floor superintendent, who may be a man or a woman, in charge of the service end of a certain section of the business. The number of women in these positions and in the buyers' positions is increasing rapidly.

The accompanying chart shows what is meant by the promotional stream through which beginners may be advanced in the store organization:



This chart, in use in one well-organized store, is shown to all beginners and suggests to them three possible lines of promotion.

From this chart, for instance, it will be seen that a girl might enter a store as a cashier, at the minimum salary of \$8.50 a week. With the automatic increase of 50 cents every six months, which this store gives, she may advance in her position as cashier to a maximum salary of \$11 a week. If she is entitled to receive advancement above the \$11, she may be transferred to a selling position or to a merchandise clerical position at a much higher salary. From the merchandise clerical position, or from the selling position, she may be made an assistant buyer at a salary ranging from \$14 a week to \$60 a week. If she is successful in this work, she is in line for a buyership, with a salary range up to \$8,000 a year.

It is interesting to note that in this store where there were 40 assistant buyers, 31 of them are women. *Twenty-eight of these women have been promoted from the elementary positions of cashier, stock marker, and office clerk.* The average length of service required for this group to reach an average of \$30 a week is five years.

ADVANTAGES OF RETAIL SELLING COURSES TO STUDENTS.

The immediate object of any vocational course of study is to fit one for employment in the vocation selected; the ultimate object is to develop individual power. Incidentally, vocational courses compare favorably with other educational courses. Related academic subjects and an approved educational treatment of technical subjects insure a course of the highest possible educational value. One of the most important phases of vocational training is the placement work

that must follow the training period. It will be apparent to those who study the question carefully that retail selling students have the advantage of having secured their training in a course that is the joint result of the experience of educators and retail merchants. This means that there is a demand for graduates of such courses. The business men who cooperate in the conduct of the course by offering opportunities for getting store experience, agree to employ permanently, when needed, those who have received this training and who are approved by the educational authorities. Experience shows that they are eager to get such graduates. Having had a part in their training, these merchants are quite sure to watch their development carefully and promote them rapidly if they succeed in their work.

There has never been a period in the world's history when it was more incumbent upon parents to give boys and girls some kind of vocational training as a part of their education than it is to-day. The great world war has hastened the time when no able-bodied person can be content to lead an idle life. Indeed, many States have passed laws making labor compulsory for those who are able to perform some useful task. People of wealth are unwilling to give up active participation in business simply because necessity does not compel them to continue. The very best safeguard against future want is an education that before the end of the high-school period qualifies every boy and girl for a definite vocation. This does not mean that advanced education should not be taken advantage of whenever possible, but even those who go to college will find vocational training helpful to them no matter how far they may go with their education. A study of the course outlined in this bulletin will show that only a comparatively small portion of the time devoted to a high-school course is necessary for the completion of the training for retail selling. With adequate credit allowance toward graduation for retail selling courses, every pupil pursuing general academic courses can be given training for the retail selling vocation without educational sacrifice.

RELATION BETWEEN RETAIL-SELLING COURSES AND OTHER HIGH-SCHOOL COURSES.

Almost simultaneously with the merchant's realization of the need for trained employees came the desire on the part of some educators to offer training courses in the high school which would lead to retail selling and other positions allied to selling. Some confusion has arisen in thinking of the place of such courses in our high school program. Since they offer training for definite vocations, during the early development of training for retail selling it was not easy to determine just where such courses would best fit into already organized courses of study.

As has been pointed out, the advantages of such training were first shown by classes in salesmanship for employed sales people independent of the schools. As an outgrowth of this successful experiment high-school classes in retail selling were organized. In some places these classes have been organized as a distinct and separate department; in other cities they have been organized as a part of the commercial course; and in still others they have been classified under the head of industrial education. In the opinion of those who have made a careful study of the whole subject of training for store service the place for such a course is clearly the third and fourth years of the high school, and it is further believed that it should be offered as a part of a well-organized commercial department. The Federal Board for Vocational Education considers vocational training as naturally grouping itself under four general heads: Industrial, agricultural, commercial, and home economics. This board has decided, after careful investigation, to consider training for retail selling as belonging in the commercial department of vocational training.

Commercial educators will be quick to realize the great opportunity that is thus afforded them to get behind this nation-wide movement to reach the thousands of girls and boys who for one reason or another drift into the retail business without adequate training for their life work and to provide an additional vocational opportunity for those who contemplate taking a commercial course. The course as outlined herein offers another type of commercial education in every respect comparable with such other well-defined types as general clerical, bookkeeping, stenographic, and secretarial. In no way is this new course inconsistent with or antagonistic to already established types of commercial training. A careful analysis of the Federal census figures on occupations will convince any thoughtful person that the older and better known business courses are not meeting the needs of all the young people who have claims upon public commercial education. With several courses to choose from, educational guidance of the right sort will help boys and girls in the choice of a vocation suited to their needs. It is the business of the commercial educator to see to it that his courses of study measure up to all the demands that are made upon them. The addition of a course of training for retail selling in cities will surely open another door of opportunity to business education. Backed by the sympathetic cooperation of the commercial teacher and conducted under his experienced direction, this newer offering in commercial education will rapidly win the support of all educational directors as well as of employers of service in the retail business.

SCHOOL CREDIT FOR STORE EXPERIENCE.

In mapping out the retail selling course of study provision is made for store practice, which is indispensable to the largest success of such a course. Through a cooperative arrangement with the retail stores adequate opportunity for this essential practice can be secured.

The store is glad to pay a certain wage for services during this student period. This payment is the best possible evidence with which to refute the possible charge that student labor is *being exploited*. The school in turn must allow credit toward graduation for store work under competent and known supervision. It is manifestly unfair to expect students to devote all their recreation time to outside work, and it is practically impossible to secure part-time arrangements with the stores that will not to some extent interfere with school hours. The same credit should be given for store experience as is given for any laboratory work.

For the conduct of most vocational courses the laboratory equipment is very expensive. One of the very great advantages of a retail selling course over other vocational courses in this respect is that the laboratory is the store itself. Experience has shown that merchants are only too willing to cooperate in every possible way to give the required opportunity for practice work for the boys and girls who are taking these courses in the schools. This is not only better because more economical, but also because it gives the boys and girls a chance to study conditions as they actually are in the retail store. At the same time it gives the pupils the great advantage of direct contact with business conditions while still under the guiding influence of the school authorities.

Many of the difficulties which are sure to be met when these young people first begin their work are merely matters of adjustment and understanding. They are brought back to the schoolroom for discussion or the teacher may go to the store for conference. It is of inestimable advantage that these young people can have the help of both the store and the school.

In the majority of cities it has been found that desirable arrangements can be made for practice work with the stores during the month of December, and also during the special Easter sales which cover a period of about two or three weeks. Additional store experience may be secured by so arranging the schedule as to give students an opportunity to work in stores during the luncheon hours, which are usually between 11 and 2. Some cities prefer the week-in and week-out plan. It is also suggested that credit be given for outside selling experience obtained by working in the stores afternoons, Saturdays, evenings, and holidays. For this additional store work credit not to exceed one unit may well be given.

Some of the more important reasons for making store work an essential part of retail-selling courses in high schools are the following:

1. In a vocational course theory should be supplemented by practice. This practice should be under real conditions in a real store, rather than in a "model store" in the school building.

2. The "self-development" method of teaching retail selling is based upon experience. Few textbooks are used. The teacher serves as interpreter of the pupil's store experience to the individual pupil and also to other members of the class.

3. Getting a "store background" is absolutely necessary to pupils of high-school age. Very few of them have ever had even a shopping acquaintance with stores. Some teachers have "laboratory hours," when they take groups on trips through various departments in the stores to help them still further in acquiring this background.

4. A spirit of cooperation between schools and stores may be fostered by a well-organized "cooperative plan." The high-school becomes a source from which department stores secure the "junior special group," and the store provides a research field for pupils, required home study; also materials, merchandise, printed system forms, and other things for class-room use.

5. Store practice gives greater interest in school subjects which are made to "function from the occupation." Some pupils whose grades are dangerously near the failing point are so stimulated by their store activity that they do surprisingly better work.

6. A well-conducted store demands high standards of punctuality, accuracy, and honesty. The practice work gives a particularly searching test in these and other success qualities.

7. Store contact supplements the work of the teacher. Often pupils are not convinced that the teacher's point of view regarding standards of dress and conduct is correct until they observe that the store makes these demands and insists upon the same standards.

8. Store practice makes insistent demands for poise and dignity of bearing, which these pupils must have in order to compete with the older, more experienced workers.

9. It is indeed a liberal training for the pupils to learn to adjust themselves to various groups of people—fellow workers, executives, and customers.

10. Daily experience in the store, with the constant necessity for making a choice between right and wrong, good and bad selection, etc., strengthens the will, develops judgment, and builds character.

The retail-selling course should be so planned as to permit any high-school student to select it at the beginning of the third high-

school year and to continue it to the end of the fourth year. Opportunity for store practice must be afforded, as indicated elsewhere in this bulletin.

Commercial students should pursue a common course throughout the first two years and choose from among the principal three commercial vocations, clerical or bookkeeping, stenographic, and retail selling, the one in which they wish to specialize during the last two years. Those who determine as early as the second year to choose retail selling as their vocation should not take shorthand or bookkeeping in the second year. Academic electives may be substituted.

Academic students may select the retail-selling course simply by electing the retail-selling group of electives in the third and fourth year. By doubling up seniors may easily complete the greater part of the course, even if the decision to take the course has not been reached before the final year.

PLAN FOR ORGANIZATION.

1. Call a meeting of merchants, the school board, head masters, head of commercial department, and superintendent of schools.

2. Have the subject presented by someone who will state the case fairly from both sides. To be industrially sound it must be mutually advantageous. No vocational course with practice work in retail selling can be planned and carried out without the support and cooperation of both store and school.

3. A study should be made of the kinds of stores in the city. These should be classified as to size, kind, and quality of merchandise sold. Conferences should be held with merchants to determine which days or parts of days and seasons should be chosen for practice work. It is also important that a uniform wage for such work should be agreed upon. Where this is not done, some stores offering more than others, pupils prefer quite naturally to have their practice work in stores offering the highest wage. This will interfere at times with placing some boys and girls to the greatest advantage. In every case the school should try to make a program that will allow for practice work at a time when the stores would normally need additional help. The purpose of this is threefold: First, it provides practice when the work is needed, and therefore the pupil has definite work to do; second, the pupil has to measure up to the requirements of the position; third, the store, with well-regulated cooperation from the school, will come to look upon the school as the best source from which to get new workers both for special work and for permanent positions.

4. The following retail selling programs have been outlined for high-school students:

HIGH SCHOOL COURSE IN RETAIL SELLING.

	Period.	Credits.
FIRST YEAR.		
Required:		
English	5	1
Business arithmetic $\frac{1}{2}$ year, commercial civics $\frac{1}{2}$ hour	5	1
Elementary bookkeeping, business practice and business writing (emphasis on retail store records and forms)	10	1
Physical training	2	.....
Electives (choose 1):		
Household arts	5	} 1
Science	5	
Modern foreign language	5	
SECOND YEAR.		
Required:		
English literature and composition	5	1
Commercial geography, including local industries, commercial products, and essential physical geography	5	1
Physical training	1	.....
Electives (choose 2):		
Science	5	} 2
History (to about 1700)	5	
Modern foreign language	5	
Typewriting (unprepared)	5	
THIRD YEAR.		
Required:		
English literature and composition	5	1
Retail selling	5	1
Physical training	2	.....
Electives (choose 1):		
Science	5	} 1
History (since 1700 with special emphasis on economic aspects)	5	
Modern foreign language	5	
Domestic science (unprepared)	10	
Manual training (unprepared)	10	
FOURTH YEAR.		
Required:		
Business English (including public speaking, theme writing, oral report, sales talk, and business letter writing)	5	1
American history and citizenship	5	1
Retail selling	5	1
Store practice and store mathematics	5	.....
Physical training	2	.....
Store experience: Minimum, 15 school days and 30 Saturdays during junior year, and minimum, 40 school days and 50 days including Saturdays, evenings, and holidays during the senior year, with credit as for laboratory work, maximum of 1 credit.		
HIGH SCHOOL COURSE IN RETAIL SELLING FOR ACADEMIC GROUP.		
First year: Regular academic.		
Second year: Regular academic.		
Third year:		
Required:		
English literature and composition	5	1
Retail selling	5	1
Physical training	2	.....
Electives (choose 1):		
Science	5	} 1
History (since 1700 with special emphasis on economic aspects)	5	
Modern foreign language	5	
Domestic science (unprepared)	10	
Manual training (unprepared)	10	

5. In order to insure the success of this course, some one person must be in charge who is thoroughly in sympathy with it, who will work for its success from the standpoint of the school, the pupil, and the store.

6. After the program has been carefully worked out, so that the director knows exactly what is to be presented to the pupils, the next step would be:

A presentation of the work to the pupils who are eligible to elect the course, giving its advantages and disadvantages and allowing time for individual conferences with those interested in it, so that the details may be considered carefully.

Some educators who are thinking only of holding boys and girls in school have advocated introducing this work into the freshman year of high school. We must bear in mind that to be conducted successfully this course must be advantageous to both store and school. The first year high-school pupils are too young to go into selling positions. With a little thought one can see that the course can not accomplish what has been promised if, after taking the training, the pupil is refused a permanent position because he or she is too young. In many States—and the others are coming into line very fast—boys and girls can not leave school until they are 16 years of age. Also, in many States minimum-wage legislation requires a much higher beginning wage than formerly.

This higher wage has caused the merchant to look more carefully into the quality of work that the employee can perform. As we are planning to make this work compare favorably with the other commercial work, even at the risk of beginning with few students and of having to work against many obstacles, it is fairer to all concerned to offer the course only to those who will be entitled to consideration for positions when they have graduated.

Formerly the stores did not stop to consider how young the boys and girls were who came in, or how much education they had received. Now the progressive stores are giving preference to high-school graduates for reasons which need not be restated here.

Putting this course into the third and fourth years of high school means giving the training to those who would be mature enough to take permanent selling positions on graduation. By referring to the program outlined for the junior year you will note that the beginning positions, such as stock, cashiering, and marking, are offered for the first practice work. These positions lead toward the end of the year to selling at one-price counters or in small stores and in some instances at regular counters. This plan gives at the beginning of the senior year, when business is good, workers who are ready to go at once into selling positions, and who through the senior year may be advanced under direction according to their demonstrated ability.

In a large city where this course will probably be given in several schools, and where there may be several hundred pupils taking it, one director should be in charge of the work for two reasons:

First, some one person should be in close touch with all the work that is being done in the schools and in the stores. In Boston, for instance, where there are eight schools giving such courses, it can readily be seen that a director is needed to deal with the many administrative problems connected with both store and school. All demands for pupils for practice should be made through the director where one is employed. If the stores are allowed to send directly to schools, confusion results. There is danger also that one store may prefer certain pupils and will try to get them all the time. When the calls for practice work come through the director's office, the director is able to be fair to all concerned; to see that each high school gets a proper amount of practice work; that it is varied for the different pupils when necessary; and that different types of students are sent to stores where a variety of needs are to be met.

When any difficulty arises, the director is the one to adjust the matter. She must also visit the stores constantly, seek new opportunities as the need arises, and, as far as possible, endeavor to insure a clear understanding of the responsibilities of both stores and schools.

It is no cause for discouragement if the first class electing this course is a small one. In 1912-13 the course was elected by 294 girls in Boston; in 1915-16, by 407; in 1916-17, by 435; in 1917-18, by 579.

At the beginning of the work, when the classes are small and few in number, one teacher can carry several courses. As the work grows in a large city, and the teachers increase in number, it is necessary then to have a director, as was stated above, to take charge of the work. Where part-time store classes are also carried on, it is of great advantage in many cases to have the high-school teacher carry at least one such class in a store. This gives the teacher constant chance to study the difficulties of those who begin to work without the high-school preparation and necessary maturity. It also gives her much valuable material to take to her high-school students.

The director should keep a complete record of all practice work. A copy of a record card which has proved useful will be found in the appendix. This card gives the date, store, position, department, hours, salary, and remarks, as well as name and address of pupil and of the school and teacher. Such records make it possible to know at a glance how much practice the individual has had and of what kind and how successful it has been.

Time for follow-up work should be given to each teacher. This work is as important as are the regular school duties. It is only by the follow-up work that the teacher can fairly judge some of the store criticisms. When there is a group of teachers under a director, discussion of these follow-up visits should take place at regular teachers' meetings, preferably once a week. All serious cases, especially when any adjustment is needed, or there is any question of authority, should be carried immediately to the director. Wherever any question arises, either from the school or the store side, it is wisest and best to call a conference and have all concerned present, so that each may hear the difficulties and objections. A full and free discussion of the possible adjustments will make for better understanding among all the parties to the transaction.

New work of all kinds means a certain amount of sacrifice in the beginning; but when it is understood that this is for the better training and education of our boys and girls, in order that we may fit them for some worth-while, wage-earning occupation, it does not seem too much to ask.

A course in retail selling can never be successfully carried out unless the one in charge is ready to see the matter from both sides and to realize fully that mutual interests must be protected at any cost.

OUTLINE OF RETAIL SELLING COURSES.

The course of training in retail selling in any school consists of instruction in salesmanship, merchandise, retail-store organization and system, and store mathematics, covering a two-year period. The requirements for a passing grade in retail selling are based upon:

1. Classroom work.
2. Outside work:
 - Home study.
 - Store practice.

The class-room work consists of recitations, discussions, and oral and written reviews as outlined in the following courses of study. These are given below in brief form and are given in detail in Appendix A.

JUNIOR YEAR (THIRD YEAR OF HIGH SCHOOL).

A. SALESMANSHIP.

History of development of training courses in retail selling.

Explanation of part-time courses based on required practice work in stores.

Store system, including the sales check, cash, charge, and c. o. d. sales.

Penmanship: Legible handwriting on sales checks and other records.

Arithmetic: Drill for accuracy and speed in addition, subtraction, multiplication, fractions, and percentage; drill in counting back change, measuring budgets, clothing, food.

Duties and responsibilities of various junior positions: Cashier, examiner, stock marker, messenger, office worker.

Receiving, unpacking, and marking.

Care of stock.

Business ethics: Personal appearance, dress, attitude, manner, character; rules for store employees.

English: The speaking voice, development of forceful speech, choice of words, vocabulary, notebook work.

Spelling: Customers' names, addresses, towns, streets, merchandise names, including foreign terms.

Discussion of store experience: Individual conferences regarding pupil's store work, based on teacher's follow-up work.

B. MERCHANDISE.

Textiles and nontextiles.

Classification of textiles.

Correlation of textiles with—

Industrial history,

Current events,

Commercial geography,

Civics,

Economics.

Producing markets: Buying and selling of textile fibers and fabrics.

Textiles: Raw materials of cotton and wool, manufacturing processes of cotton and wool, finished products, merchandise made from finished products.

The relation of textile study to work of a sales person.

Clothing analysis: For elements affecting style, value, quality, and price.

Merchandise study: Style, season, cost.

Shipping and transportation in relation to costs of merchandise.

Foreign-buying office: Paris, Vienna, Berlin, Rome.

Knitting and knitted goods.

Jewelry.

Toys, games.

Patterns.

Automobile furnishings and accessories.

Stationery.

SENIOR YEAR (FOURTH YEAR OF HIGH SCHOOL).

A. SALESMANSHIP: CLASSROOM WORK.

Store organization, with requirements of each position.

Store system.

Store directory.

English: Choice of words, forceful speech, speaking voice.

Approaching customers and starting sales.

Presenting the merchandise.

The selling points of merchandise.

Concluding the sale.

Service, including service features.

Waste and its control.

Arithmetic with sales slip practice.

Economics: Labor laws, public meetings, working conditions, food, health, recreation.

Ethics of business, appearance and deportment of salespeople, character analysis.

Advertising.

Lectures.

Store experience with class discussion, also individual conferences after "follow-up."

Types of customers.

Demonstration sales with class discussion, bringing out the following selling points:

- (a) Suggestion.
- (b) Substitution.
- (c) Knowledge of stock.
- (d) Accuracy in giving directions and taking address.
- (e) Service to all customers at all times.
- (f) Use of reserve stock.
- (g) Price comparisons.
- (h) Sales of higher-priced merchandise.
- (i) Naming amount of money received from customers.
- (j) Interest in customers until they leave the department.
- (k) Attitude toward gifts and tips.
- (l) Interpretation of rules.
- (m) Handling of special orders, call slips, and promises.

B. MERCHANDISE.

Textiles: Raw materials of silk, linen, ramie, jute, sisal, hemp, etc.

By-products of textile fibers.

Production and manufacturing.

Correlation of textile study with—

Industrial history.

Commercial geography.

Citizenship.

Economics.

Current events.

Markets.

Shipping and transportation of silk, linen, ramie, and other fibers.

Scientific analysis of textile fibers.

Chemical and physical tests of textile fibers.

Collection of samples of silk, linen, etc., with important facts.

Mill and factory visits, also museum.

Merchandise made from fibers studied, gloves, hosiery, linens, etc.

Ready-to-wear merchandise.

Notions and small wares.

Household furnishings.

Kitchen ware, china, glass, cutlery.

Laces, machine-made and hand-made.

Metal fibers, galvans, and trimmings.

Lectures on merchandise by buyers.

Discussion of clippings from trade papers and magazines.

Relation of selling to advertising.

Color and design as applied to clothing, house furnishings, window trimming, and display.

Standards of good taste.

Responsibilities of head of stock, sales person, assistant buyer, buyer and merchandise, manager and the merchandise.

C. OUTSIDE WORK.

Assigned reference reading.

Special investigation and research.

Observation.

Collecting articles of merchandise or any interesting material used in the manufacture of merchandise.

Shopping expeditions.

Study of advertising: Newspaper, magazine, street cars, window, and display.

Advertisement writing.

Interviews with employment managers and similar assignments.

Visits to mills, factories, museums.

Visits to shipping, receiving rooms, ventilation plants, alteration rooms of large stores.

Writing papers on all visits and assigned topics.

Notebook work on selling notes, also merchandise notes.

Compiling material and writing papers on assigned merchandise topics, such as dolls, toys, hosiery, stationery, children's shoes, etc.

A suggestive outline of the subject matter covered in lessons on store system, store organization, store directory, and all other salesmanship subjects should be taken up with the same attention to detail.

D. STORE SYSTEM.

Importance of accuracy and legibility on sales slip.

Significance of the parts and need for printing on the slip.

Sales to be made out, cash delivered, payment by check, payment by money order.

Cash send sales.

Discussion of delivery rates: Parcel Post; express.

Use of special delivery sticker (rush).

Use of special messenger.

Charge delivered with coin sale.

Charge delivered without coin sale.

Opening of accounts.

Deferred charges.

Employee's charges.

Charge and send to same person sale.

Goods sent on approval.

"Memo" charges.

Charge to one, send to another sale.

Charge to one, send to another, purchaser by third sale.

Exchanges, even exchanges, uneven.

Refunds and credits.

C. O. D., C. O. D. allow examination.

Deposits.

Advance payments.

Shopping cards, transfers.

Discounts.

Future date sales.

Special orders.

Floor managers, signatures.

Damaged goods.

Adjustments.

Price tags and slips removed.

Customers' own property sale.

Printed forms.

RETAIL SELLING EDUCATION IN SMALL CITIES.

The course in retail selling has its place in the smaller centers as well as in the larger ones; for example, one small city¹ with a population of 20,000, has had the retail selling course for 2½ years. One of the leading merchants was first interested. He invited the superintendent of schools to go with him to a meeting of the Indiana State Retail Dry Goods Association, where the subject of teaching retail selling in public schools was presented and the result was the introduction of the work into the high school.

A specially trained teacher was engaged, and her time was divided between school and stores. In the early morning, on Tuesday, Thursday, and Friday, the teacher, who was paid by the public schools, went to the largest stores in turn to give instruction to those already engaged in store work. The results of her work have been so convincing and have inspired such confidence even among competitors that now seven different stores send pupils to the one store having the largest and best classroom for the morning work. This saves the time of the teacher and pupils and helps to emphasize the professional attitude toward the work rather than the individual attitude.

It is significant that these seven stores *trust* and believe in the value of the educational work to the extent of allowing employees from these competing stores to come together in one store. It shows the growing spirit of cooperation for the public good and illustrates the strength and influence of the benefit of such social education. It has been too long the custom for various merchants in communities to work alone and apart. Now through retail and commercial associations many merchants have come to see that what benefits all benefits each and vice versa. When merchants can not come together on any other ground, this educational work unites them. Experience has shown in both large and small cities where the retail selling course has been directed by a trained teacher, that all are interested, and in time, without exception, the merchants have not only made sufficient practice work possible, but have opened all the facilities of the store to the pupils and teacher. The great value of such a laboratory for the study of merchandise as well as for service and organization can not be overestimated.

In this small city the teacher devotes the rest of the morning after the class instruction to follow-up work in stores. At 1 o'clock she goes to instruct the high-school pupils. Emphasis must be placed on the need of time being given to the teacher for careful follow-up work in all cases. The hours spent in follow-up work in stores are as truly a necessary part of this course as the classroom period, and must rank with it.

¹ Logansport, Ind.

One of the merchants of this city remarked that even although the city engaged but 25 new sales people in all during the year there would be justification for the high-school group. Another advantage which he mentioned was that when the merchants look to the retail selling course in the high school as their resource for the new employees they do not have the unhappy experiences of the past in making enemies of customers by refusing to engage their friends and relatives, or by engaging them only to find that incompetence must lead to dismissal. The question has to be decided in such a case as to whether it is better to let the stores suffer by keeping such incompetent people or run the risk of offending friends and relatives in the community by dismissal, which in a small city means the loss of several customers. By the agreement, which should always be made between stores and schools, it is the duty of the merchants to give the new opportunities in the store to the pupils in high school who have elected this course, presumably because they prefer this work, and who are being specially trained for it.

The practice work, which is always a necessary part of the high-school course, gives stores and school a chance to determine which of these young workers were adapted to the various positions in the stores. By a process of elimination or more training many sad misfits and mistakes are avoided. Think what it will mean to the boys and girls of the future to begin work under such intelligent guidance.

PART-TIME CONTINUATION EDUCATION FOR WORKERS EMPLOYED IN RETAIL STORES.

Besides giving preparatory courses in high schools, which in time will help to raise the standard for retail selling, our public schools are giving thought to the needs of those already working in the stores. The younger employees, generally from 14 to 16 years of age, are those who have left school at the earliest possible minute, either because they were eager for something to do or because of economic pressure at home.

The number leaving because the school has failed to hold them is greater than the number of those who go to work because of necessity. A study of more than 800 such girls working in stores in one city shows that more than half left school from choice and not from necessity. Experience has shown that these groups can be awakened to the delights of education by teachers who are specially trained to function all classroom work from the occupation. English, arithmetic, spelling, geography, and other subjects must be taught to these continuation school groups of younger workers; but so long as these subjects start somewhere in the store, connected in some way with

the things the boys and girls are doing or seeing or hearing, there is no limit to the interest that can be aroused. The possibilities of this continuation school work for these particular groups are beyond belief to those who have not seen the results of such teaching.

ENGLISH.

Facilities and correctness in oral expression, so sadly lacking in most of these younger employees, is brought about by this common-sense method. Merchandise is constantly used for observation and description. Imagine, if you can, the quick, interested answers that come from minds doing their own thinking when the teacher asks for words describing any particular piece of merchandise. The friendly competition of trying to think of the greatest number of words which are specially applicable to this apron or waist or piece of material stimulates to quick, intelligent thinking. New words are added to the vocabulary and good sentences are easily given. In a group usually inarticulate at the beginning, a written description of some favorite line of merchandise such as hosiery, gloves, toys, veils, etc., is made with no sense of its being a task. In such a description may be included the history of the finished product with illustrations. It can be readily seen that the pupils are gaining in power of correct expression, spelling, penmanship, and vocabulary, as well as in knowledge of materials.

ARITHMETIC.

Employers everywhere complain that young workers are inaccurate and incompetent in dealing with the simplest figures. Often the regular schools are unfairly blamed for this; but it is their part to give the fundamentals, and in so doing it is the duty of the regular school to teach the art of arithmetic, the art of penmanship, etc. The continuation and vocational school can put the emphasis on the use to which the knowledge of these subjects is to be put.

As this instruction is given to those already working, the pupils have a different viewpoint. The teachers in the regular grade school may tell classes over and over again that they are going to need arithmetic if they go to work. Too often this falls on the inattentive ears, but boys and girls who go to work in stores can not be there long without realizing the advantage which this knowledge would give them. Instead of a listless, unwilling group, these store classes are alert, enthusiastic, through their desire to learn what is going to be useful to them in their daily work. Thus do they gain in the so-called "cultural" subjects through their interest in their work. Sometimes this awakened interest in learning more leads these young workers to go back to the regular school.

Every effort is made in the arithmetic work to dispel fear of the subject. Because of repeated failures in understanding arithmetic many in this group are afraid of it, and therefore are constantly confused. Reference to the course of study (Appendix D) will show that emphasis is put on the short operation and upon store methods of reckoning. Quick addition and multiplication, fractions in use in the stores, and percentage cover the essentials. Accuracy and then speed are worked for at each session.

SPELLING.

Spelling may be begun by asking for words from departments in which the boys and girls are working, names of positions held, of merchandise, people, streets, etc. These words, with those which are misspelled in notebooks and written exercises, will give plenty of material for spelling.

GEOGRAPHY.

Starting with the store, there are endless ways of reviewing geography and of giving advanced work. Take trade routes, for instance, which too often mean nothing to pupils in the regular school. In any particular store a group asked to tell over what route a certain line of merchandise would have to come to reach that store would be vitally interested. Also take a discussion on transportation as affecting price; select some article such as a linen handkerchief, for instance. The class will be interested to discuss why it costs more than a cotton handkerchief. That increased cost is partly due to cost of transportation makes a study of trade routes interesting. Reports made by the National Society for Vocational Education on surveys conducted in Richmond, Minneapolis, Indianapolis, and St. Paul, and also United States Bureau of Education, Bulletin No. 9, 1917, on department-store education, contain many other examples of how store education may be connected with life.

PROMOTIONS.

There are also other evidences of the value of the continuation-school work. For instance, promotions in the store can be traced directly to the work in such classes. The teacher with the proper authority in the store can recommend for promotion the boys and girls she has had the chance to study. The table following will show the promotions carried on in this way in two large stores and one small store.

RETAIL SELLING.

PROMOTIONS IN STORE NO. 1.

From—	To—	Weekly increase.	From—	To—	Weekly increase.
Bundle girl.....	Auditing office....	\$1.00	Bundle boy.....	Stock office.....	\$1.00
Do.....	Retail office.....	1.00	Parcel collector.....	Cashier.....	1.00
Do.....	do.....	1.00	Bundle boy.....	Stock office.....	1.00
Do.....	Cashier.....	1.00	Do.....	Stock boy.....	1.00
Inspector.....	Bundle girl.....	1.00	Do.....	Shipping room....	1.00
Bundle girl.....	Retail office.....	1.00	Messenger.....	Parcel collector....	1.00
Do.....	do.....	1.00	Do.....	do.....	1.00
Examiner.....	Check girl.....	1.00	Bundle boy.....	do.....	1.00
	(Further promo- tion soon.)		Till boy.....	Inspector.....	1.00
Bundle girl.....	Cashier.....	1.00	Messenger.....	Office boy.....	1.00
Do.....	Retail office.....	1.00	Bundle boy.....	Stock.....	1.00
Do.....	do.....	1.00	Do.....	Shipping room....	1.00
Do.....	Cashier.....	1.00	Do.....	Auditing office....	1.00
Do.....	do.....	1.00	Messenger on time	Stock.....	1.00
Do.....	do.....	1.00	desk.		
Do.....	Retail office.....	1.00	Bundle boy.....	Parcel collector....	1.00
Do.....	do.....	1.00	Do.....	do.....	1.00
Parcel collector.....	Office.....	1.00	Do.....	do.....	1.00
			Do.....	Office boy.....	1.00

PROMOTIONS IN STORE NO. 2.

Bundle girl.....	Mail order.....	\$1.00	Bundle boy.....	Stock.....	\$1.00
Do.....	Teller.....	1.00	Floor boy.....	Head of floor boys.	1.00
Do.....	Stock.....	1.00	Errand boy.....	Shipping.....	1.00
Do.....	do.....	1.00	Bundle boy.....	Stock.....	1.00
Do.....	do.....	1.00	Do.....	do.....	1.00
Errand boy.....	Shipping room....	1.00	Do.....	do.....	1.00
Messenger.....	Special messenger.	1.00	Do.....	do.....	1.00

PROMOTIONS IN STORE NO. 3.

Errand girl.....	Check girl.....	\$1.50	Errand girl.....	Check girl.....	\$1.50
Do.....	do.....	1.50	Do.....	do.....	1.50
Do.....	Office work.....	1.50	Do.....	do.....	1.50
Do.....	do.....	2.00	Do.....	Plating.....	2.00
Do.....	Packer.....	1.00			

Summary of promotions in three stores since Oct. 2, 1916.

	Number of promotions.		
	Total.	Girls.	Boys.
Three stores.....	65	36	29
Store No. 1.....	36	17	19
Store No. 2.....	20	10	10
Store No. 3.....	9	9	

In many ways, also, the continuation school has a greater social opportunity than the other types of classes. The pupils being young are more easily influenced, and under the direction of wise teachers they adjust themselves more intelligently to the new and critical experience which their store work brings. As we have said before, at a time when wise guidance is much needed, a specially trained, well-qualified teacher is at hand to lead and direct.

PROGRAM OF PART-TIME CONTINUATION COURSE OF STUDY.

The following subjects may be indicated as providing a suggestive program for use in States allowing four hours a week for continuation-school attendance.

In Appendix B these subjects are arranged for a two-year course; pupils 14 and 15 years of age taking the work arranged for the first year; pupils 15 and 16 years of age taking the work arranged for the second year.

Subjects.

Arithmetic.....	30 minutes a week.
Spelling.....	30 minutes every 2 weeks.
Hygiene.....	30 minutes every other week.
Physical exercises.....	8 minutes every week.
Textiles and merchandise.....	24 minutes every other week.
Penmanship.....	20 minutes every week.
English.....	30 minutes a week or 15 minutes daily.
Commercial geography.....	24 minutes every other week.
Citizenship.....	30 minutes every week.
Current events and history.....	18 minutes every other week.
Business ethics.....	15 minutes every other week.
Lectures and extras.....	15 minutes every other week.
Business topics and store problems.....	32 minutes every week.
Salesmanship and store topics.....	45 minutes every week.

In the detailed outline given in Appendix B this program is so arranged that the subjects alternate weekly, viz: Spelling to alternate weekly with hygiene; textiles to alternate with store subjects; English to alternate with civics; commercial geography to alternate with business ethics and current events combined.

EVENING SCHOOL EXTENSION COURSE IN RETAIL SELLING.

Extension courses in retail selling in the evening schools for older sales people who can not take advantage of the day part-time instruction, are for the most part carried on as short-unit courses. Fifteen or more may elect salesmanship, textiles, color and design, English, or some one line of merchandise for special study. A certain number of hours must be given to such courses. When the older employees understand about educational work, they are interested to enlist in such classes and where these short-unit courses for older people are taught by a specially trained teacher, there is an increasing demand for the work. Such courses are being carried on successfully in large and small cities. In the smaller cities and towns owners of stores usually attend themselves. It is wise to introduce these courses as short-unit courses of 10 lessons. The first course should be on general store problems touching somewhere the special problems of all in the group. A demonstration sale by some member of the group using his own merchandise will give practical material for many lessons. It will also stimulate more discussion than any number of lectures. A second course of 10 lessons may be decided by vote of the group or by demands of other candidates and may be textiles, color and design, salesmanship, boots and shoes—leather.

Such a short-unit course of 10 lessons, which has been given successfully in a Massachusetts town, is outlined in Appendix C. This may suggest what may be done in other subjects. Attention must be called again to the need of a specially trained teacher.

RETAIL SELLING EDUCATION IN LARGE STORES.

As all stores are different in organization and policy it is unwise to try to give in detail any one plan for the training by large stores for their own employees. Certain general principles, however, do govern the organization and conduct of such training. A specially trained educational director is absolutely necessary for the carrying out of any constructive plan. By "specially trained" we mean one with knowledge of every part of store organization, of all of their departments' functions and positions, of the duties of the various employees, and the qualities needed to fulfill these duties. Also in addition to this technical knowledge, the educational director must have the professional training which will make it possible for her to instruct individuals and groups from the highest to the lowest. In general, the store force for training may be divided into the following groups:

1. New employees.
2. The junior force, consisting of the youngest workers, such as:
Cashier,
Examiner,
Markers, etc.
3. Sales people.
4. Office workers.
5. "Nonproductive" groups, not included with juniors, as:
Elevator men,
Porters,
Drivers, etc.
6. Executives, especially floor managers and buyers.

The amount and kind of training for groups and individuals must be determined by careful analysis. If the store is well organized it will not be difficult to find the source of error and misunderstanding and inefficiency. When well-qualified executives have clearly defined duties and authority the plan for training can be most satisfactorily carried out. After the first instruction to new employees in system and policy, follow-up work is necessary. Sometimes more training must be given or transfers recommended when the new employee does not show fitness and ability. Groups as outlined above meet for conference and are taught after investigation. The educational director must know conditions thoroughly before attempting to reconstruct or improve them. More and more specialized individual work is being done, such as "training on the job" and departmental work.

This must often include study of merchandise, its care and arrangement, history, and manufacture. It will be seen that the general principles that should govern in the organization and conduct of a course of instruction in retail selling by large stores for their own employees must include much more than the instruction in retail selling. When all other conditions are known to be right and just, time can then profitably be put upon instruction in retail selling, including both merchandise and service. One other fundamental to the successful working out of any training in stores must not be forgotten, and that is well-selected people for the training. In a preceding section the waste and sad consequences of a large labor turnover have been described. Obviously if training in a store is to count, the people employed must be intelligently selected. When this is done the far-reaching and good results are unlimited.

Education has a distinct contribution to business, and progressive merchants generally are establishing educational departments. Education is now looked upon by many as a necessity, and the merchants who employ the trained educational director look upon the importance of the department as second to no other.

THE MERCHANT'S PART IN RETAIL SELLING EDUCATION.

The merchant's part in this program is not only important but absolutely necessary for the successful working out of a course in retail selling. A chance to have practice work is good, but such practice work must be considered, planned, and followed up by the store authorities as well as by the school. All this requires patience and education, as it is a new procedure. The school must consider it a part of its duty to show the merchant the many advantages of a plan which shall give needed experience with progression from beginning positions to others which shall test and train the pupils. Such a plan can be worked out between the teacher and the merchants co-operating.

Certain things must be decided upon in order that there be no confusion or dissatisfaction:

1. The wage to be paid to these part-time workers from the schools. A uniform wage has advantages, but there are different grades of stores, requiring differing degrees of ability, with corresponding compensation, just as there are different requirements in departments in any one large store. Where there is a minimum wage, this usually determines the basis for paying all special workers.

2. The positions should be only those needing extra workers, that ordinarily would be filled by new employees. When this part-time group is placed where no extra help is needed, the purpose of the practice work is defeated.

3. Merchants should look upon this high-school group studying retail selling as the *first* source of supply for the new positions, next to promotion within the store. The students in the junior year class naturally are put into beginning positions, while the seniors are used to fill experienced or more difficult positions.

4. In the spring term the merchant or his employment manager should have decided which ones in the practice group he wishes to engage for permanent work. If careful follow-up work has been done the choice will be intelligent, based on actual practice and observation, with some idea of the ability of this part-time student worker to fill the position. If at this time it is a question of having the full time of the pupil in order to hold the position permanently, the school authorities in consultation would do wisely to consider making this possible. In one large city the pupils in senior and junior class taking the course in retail selling are allowed to take regular positions by May 1 and 15. By this plan, as briefly outlined here, it will be seen that the merchant's part is to give organized, supervised opportunities to this group of high-school pupils with the aim of securing trained workers for all new positions not filled by promotion within the store. The school committee, on the other hand, must consider the time, hours, and days, or parts of days, and months when these workers are most needed by the merchants. By working together in this way great benefits accrue to all concerned.

5. The merchant or his representative should be a member of the advisory committee of the retail-selling course and should consider attendance at its sessions vitally necessary.

6. The merchant, as well as the school authorities and the parents, must remember at all times that any new educational movement takes time and infinite patience. The merchant's belief in the ultimate result must be strong enough not to be shaken by apparent failures. In a work which deals so largely with human beings there are bound to be some difficulties, but, with a vision of what this plan will mean in the end, progress will slowly but surely win all. New movements need the vision and belief of a few to carry on the many who see only the temporary situation. Right here is where merchants can exercise great and wise power for far-reaching results.

FINANCIAL ADVANTAGES OF A PART-TIME PLAN.

The economies effected by building up a permanent force have already been shown in the discussion of the labor turnover. The following letters will show the viewpoint of the employment manager in one large store, comparing these part-time trained workers with the drifting group of specials ordinarily employed.

Two letters from retail-store employment manager to school director of retail-selling courses:

I.

"The following is a tentative plan for the high-school girls for the spring season of 1917. This is just a start, and if there are any changes I would be glad to talk it over with you. Copies can then be sent to all the teachers, so they will understand. I think it rather important that after the groups are organized a special effort should be made to keep them intact.

"*Groups.*—One group of cashiers, 20.

"Basement sales group, 15.

"Main-store sales group, 12.

"Stock and markers, 10.

"*Cashiers' group.*—Make a selection of the most likely material possible of girls who are really interested in the work. I would like to use some of the girls who came into the store for the Christmas selling.

"The educational office and Miss —— will supervise the training of this group, meeting four afternoons during February and March.

"By giving this group closer supervision it will establish more interest in the work and give us a smaller, better-trained resource than by taking more girls than just this 20. We will also continue to use the three groups organized for Christmas.

"*Basement sales group.*—Select any girls from the sales people during Christmas who seem adapted or interested in basement work. These with any new people needed to make 15 should come in two afternoons for special training in basement system.

"*Stock and markers.*—I do not think it necessary for these girls to come in for any training. They should be carefully selected and the group might include some girls who have possibilities but are not mature enough for selling and cashiering.

"*Main store sales group.*—I would like to organize some girls from the best of the Christmas sales people for the following departments: Veilings, neckwear, jewelry, toilet goods, handkerchiefs, misses' waists and undermuslins, misses' millinery.

"I would suggest the following and four more whose names I will give you later [names inserted].

"Some of these will be used for the fourth-floor misses' departments and some will be used for street-floor departments.

"*Schedule.*—The following schedule would be all right from our end if all right with the schools:

"Cashier group: February 15, 22; March 1 and 8.

"Basement sales group: March 2 and 9.

"Main store sales group: February 13, 20, 27, and March 6.

"All application blanks and certificates not on file in the employment office should be handed either to the teacher or the employment office by March 1.

"New people for any of these groups should come in for an interview, with a note from the teacher stating for which group the girl was intended.

"Will you let me have any changes or suggestions at your convenience?

"Sincerely, yours,

"(Signed)

_____,
"Employment office."

II.

"While the matter is fresh in our minds, I have drawn up a plan for the high-school girls for next Christmas, December, 1917. It is the concensus of opinion that the work of the high-school girls this year was very successful.

"The selling groups in the handkerchief, toy, and jewelry departments were well organized, and in most cases the girls were particularly adapted to the work.

"Compared with the outside specials who came in for the Christmas season, the high-school girls were by far the most adaptable and easiest to work with. Their salesmanship training had given them a very intelligent conception of the job as a whole, of their place in the organization, and what was required of them. They made fewer errors and when spoken to about mistakes would not make them again. They asked more intelligent questions and wanted to know the whys and wherefores of what was done. They were more enthusiastic and the work-together spirit was much in evidence. Many of them were quite immature, but in only one or two cases did customers recognize their youth. They were teachable and applied themselves closely.

"The sales average was high. In the jewelry department the high-school girls averaged about the same or better in the different sections than the other specials. In the toy department several of the sales people made a record.

"I will send you with our plan for the high-school girls for spring the judgments of the individual girls, or I will go over them personally with you or the teachers, if you wish. With all good wishes,

"Sincerely,

"(Signed) _____."

The part-time agreement not only calls for all this from the merchant but also that the school authorities give these pupils credit for practice work. When the course was first started and no provision

was made for practice work or for putting the work in as a course, it worked unfairly for the pupils who were obliged to stay after school to make up academic lessons because of the time spent in practice work, and for this practice work no credit was given.

Some other advantages to the merchants that will come from this part-time plan will be a better general attitude throughout the store; general improvement in service given to patrons, added prestige in the community by raising the general educational standard; many more intelligent customers, because these pupils are all customers and many of them may be purchasing agents of homes. Another very strong social advantage of the part-time plan as outlined is the elimination of widespread adverse criticism by those who continually shift from one store to another. These drifters for the most part are discontented and their attitude and influence is largely destructive both within and without the store. Right here one might note that by the part-time plan a large part of this large army of drifters will be turned into trained, efficient workers with a different outlook on life and work. Thus may the plan be called social education as the standards for such workers and the whole community will eventually be higher and better.

TRAINING OF TEACHERS TO GIVE RETAIL SELLING EDUCATION.

Before merchants understand what a distinct contribution education can bring to the business problems, or before they can see some of the results of the educational work, it is quite natural they should think that only those who have grown up in a store can properly train and instruct the workers in a store, but retail selling is a profession, not a trade, and the sales person's mind must be trained for the most complicated of all problems, the understanding of people. Every customer is a different problem, therefore, the necessary and all important thing is the training of judgment. It is not possible to state definite processes as one can when dealing with a machine. Trade processes can be taught by skilled workmen, and in trade education this is an essential part of the work, but in retail selling, which requires primarily the training of the mind, a specially prepared teacher is absolutely necessary.

This teacher must have store experience, and much of it. The more store experience the teacher has before taking training, the better, but also while in training, store organization and all departments as well as merchandising, publicity, etc., must be studied under direction. The store is the laboratory in which experience must be obtained. The classroom work is for the interpretation of these experiences, for the development of better and keener powers of observation and interpretation, and for the study of merchandise, including history and processes.

There are three phases of teacher training:

1. Getting experience and information.
2. Putting this subject matter into well developed outlines and later into teaching plans.
3. Actually teaching individual groups and departments.

Since a large educational background is essential for the understanding and handling of retail selling and merchandise, it is recommended that candidates should be of college or normal-school grade. The one-year graduate course which has been conducted by the Women's Educational and Industrial Union and Simmons College in cooperation with the National Retail Dry Goods Association, admits graduates of colleges and of four-year normal schools. The following will give a brief description of this course:

In order that the students may enter upon the course with a general understanding of the conditions, problems, and possibilities of the work, and with some familiarity with the system, organization, and daily life of a department store, a two months' period of selling experience is a prerequisite of admission. The training itself includes practice teaching, classroom discussion, and written reports, and constant observation, research, and supervised work in the stores.

On four mornings a week from 8.30 to 11.30 the teachers in training attend the sessions of the sales girls' class, a group of employees sent from the various stores of the city. This phase of the training, which is comparable to that given in a normal school, enables the students to make immediate and direct application of educational principles, and to prepare and adapt the material gained from their store experience in a way which will meet the needs of people actually at work. As soon as feasible after the beginning of the term, the teachers in training plan and conduct the lessons themselves. Further opportunity for practice teaching is afforded through observation and substitute teaching in the public high and continuation schools, and in the State university extension courses.

At the close of the session of the sales girls' class the normal class meets for discussion and criticism of the practice teaching and for analysis and interpretation of store experiences. For two periods in the afternoon the students meet again for classroom work, which includes courses in store problems, sociology, psychology, economics, and textiles. Written work includes reports on store experience, merchandise studies, and special investigations of service problems.

In addition intensive studies must be made of the system on all the cooperating stores.

The essential background of the course is the actual store experience. This differs from the preliminary experience, which is one of the entrance requirements in that it is systematically arranged and carefully supervised. Every other phase of the training is

vitally related to it and depends upon it. From it is drawn the subject matter for lessons for the sales girls' class; it provides the material and source of information for all written work; it forms the basis of classroom discussion, the various courses being considered with special reference to their application to department-store problems.

This is only a brief statement of the course and simply serves to indicate its character and scope in a general way. True of all educational work, it is especially true in this field, that a rigid program can not be laid down and absolutely adhered to, for new conditions are continually confronting the student. At this time, when men are being withdrawn from the stores into military service, special emphasis must be placed on employment and on the emergency training of women to take the places which have been vacated. It is obvious that since the laboratory (the department store) is constantly developing the course itself must change each year to respond to new problems and new needs.

In State universities which are in or near large cities the course could be offered in the senior year provided enough time was given for practice work. This must include the store experience and teaching as suggested, both done under direction and supervision. As far as possible the work in the stores should be in positions actually needing workers. The week-in and week-out plan may be followed. Saturdays, which are busy store days in most places, may be given entirely to store work; also parts of other days. In the month of December, when many extra helpers are needed, the teachers can get most valuable experience either selling in the busiest departments or doing floor duty or personal service. What is learned at this time may be used after Christmas as the basis of class discussion. Written reports of store work should be received, and special studies in system, store service, merchandise, including textiles and non-textiles, should be assigned.

The course in teacher training, which is briefly outlined here, can best be organized with the help of the Federal Board for Vocational Education. It is a course which needs unusual study and thought. Many courses in so-called salesmanship throughout the country are superficial. Commercial teachers have added the "subject," salesmanship, using textbooks.

Only a comprehensive *course*, which includes related subjects, based, for the most part, on detailed study and actual experience, can be recommended. By individual research and practical study, application of all principles to concrete problems, these teachers get the solid foundation for professional work which is broadly and truly educational.

There is deep satisfaction in teaching a subject every phase of which admits of practical application. Such application to personal and vocational problems is the heart of industrial education, which, as a field of helpful endeavor, offers far-reaching possibilities. The preparation and training necessary for successful teaching of retail selling and merchandise have been discussed. Let us now consider what the personal returns may be, what this work may mean to one who undertakes it after perhaps some years of experience in academic classes.

First, there is the element of variety. In a one or two year course, correlated, as has been suggested, with other high-school subjects, a wide range of interests is presented. Not only are many branches of study represented, but there are also divergent topics drawn from commerce, trade, economics, manufacture, and history. Almost any subject has some bearing on this course in retail selling. It is this widespread interest, this unlimited field of operations, which makes the task of training young people for the mercantile world a stimulating, broadening, and enlivening experience for the teacher. The selection of material from the correlated subjects suited to the purposes of the course involves research and a careful sorting of facts for those which are significant and useful. This study makes for scholarship. Another field, having less to do with books than with affairs, confronts the teacher. It is business. The teacher must understand and be able to interpret to her classes events and movements which influence business in vital ways. This element of timeliness in teaching makes for progressiveness and precludes the possibility of a teacher's "going stale" in her chosen subject.

As the work is likely to include classes of high-school pupils or prospective store workers, and classes of actual employees drawn from one or more stores, constant adaptation of the method and material of teaching is necessary. No two stores are identical in system, in the grades and lines of merchandise carried, in the number of names on the pay roll, in policy, or in organization. Nor is business stationary. Questions settled in a certain way one year may be radically altered the next. Unexpected situations raise new problems to be met by new measures. Thoughtful study, reading, and observation are as necessary for live, spontaneous teaching of a vocational subject as for the strictly academic branches.

Training different classes of pupils in accordance with such varying conditions and requirements of employment develops in the teacher qualities of adaptability, originality, and resourcefulness; it broadens her point of view, and by increasing her knowledge of business procedure, strengthens her position with store executives. Thus, the person who may have been regarded by the managers of a store as a detached teacher, helpful in her way, but not supposed or

expected to be of much practical value in the store, may now become, in a sense, a partner, able to make valuable suggestions for the development of the personnel and ready to carry out plans which actually benefit the business. In this capacity the "teacher" is a startling revelation to the merchant, and, as a matter of fact, the discovery of such power is often a revelation to the individual herself. The stimulus resultant from such discovery marks for many the birth of a creative spirit which grows and develops in response to a definite and visible need.

In this course in retail selling there is no cleavage between classroom work and personal training and supervision. Consideration of personal standards, needs, experience, and ambition in relation to a business career inevitably accompany the teachings of every subject in the course. Observation of the individual as a class member and also as a store worker leads to discussion of conduct, appearance, interest, effort, the application of principles to practice. The teacher's feeling of responsibility for the quality of work done by her pupils takes her out of the classroom and into the store for frequent "follow-up" visits, and the reports given by floor managers and superintendents are often the means of establishing mutually helpful relations.

In all of these ways personal interest is aroused through personal effort in behalf of the individual, and this leads to the development of social consciousness, that sense which inspires one to think and act in terms of permanent social values.

APPENDIX A.

SYLLABUS FOR SALESMANSHIP AND MERCHANDISE.—COURSE IN RETAIL SELLING.

JUNIOR YEAR.

FIRST WEEK.

Classroom work:

Organization of class. Introductory lesson on meaning and requirements of course.

The sales book: Use; need; make-up; value; place in the store; carbon; sales check; tally cover; tissue. Necessity and destination of each part.

Textiles: Why knowledge of textiles is necessary to a sales person. Classification of textiles. Kinds of textiles with which stores are chiefly concerned.

Outside work:

Visit to department store with which pupil is not familiar, and writing account of visit. Comparison of various forms of sales checks received by pupils as customers.

Observation trip to department store, noting number of articles made of textile materials. Collection of samples of cloth representing each group of fibers in common use.

SECOND WEEK.

Classroom work:

System: Legibility of handwriting on sales check. Erasures. Floor manager's O. K. The store point of view; the customer's point of view. Sales check. Cash sale. Cash "take with."

Correlation of textiles with (a) Industrial history, (b) current events, (c) commercial geography, (d) civics, (e) economics.

The buying and selling of textiles in industry. Labor, wealth, international commerce, service to public in retail distribution.

Analysis of sample of cotton cloth to introduce spinning, drawing, twisting, winding.

Outside work:

Cash sales check showing variety of checks and systems. Destination of each part of sales check.

Clippings on any of the subjects discussed in class.

Market quotations of raw products, wholesale and retail.

THIRD WEEK.

Classroom work:

Sales-check practice.

Personal appearance: General essentials for good personal appearance. Minor details to be emphasized. Clothes, the care of clothing.

Spinning: Variety of spindles used in different countries.

Analysis of sample of cotton cloth, introducing weaving.

Kinds of weaves: Plain, diagonal, cassimer, wide wale, satin.

Outside work:

Written paper on "Why I should improve my personal appearance."

Assigned reading on the hygiene of clothing; primitive spinning; history of early spinning; and invention for spinning and weaving.

Samples representing different kinds of weaves. Mounting samples and drawing the designs on blotting paper.

FOURTH WEEK.

Classroom work:

Sales-check practice. "Cash-send" sale. Charge, take with. Charge, send.

Personal appearance: The hair; the teeth.

Kinds of weaves.

Knitting and knitted goods.

Outside work:

Investigation of system used in grocery, meat, and provision stores.

Investigation of what is meant by "coins," and why they are used.

Samples illustrating each weave.

Reading assignment: Kipling's "The Cat that Walked by His Lone" for picture and primitive life.

FIFTH WEEK.

Classroom work:

Sales-check practice. Use of coin. Charge "with and without."

Personal appearance: Waists, shirts, collars, skirts, trousers, repair, and mending.

Discussion for and against "Charge accounts."

Introductory lesson on cotton. Why is it the most important fiber? Why is knowledge of cotton necessary to a sales person?

Sources of supply.

(a) Foreign countries.

(b) United States.

Clippings and photographs illustrating cotton production and manufacture.

Outside work:

Written paper on "If I were a storekeeper, would I prefer a cash or a charge business?"

The spelling of names of suburbs.

Written list of articles of merchandise made of cotton.

Physical geography: Egypt, India, China, Peru, United States, etc.

SIXTH WEEK.

Classroom work:

Sales-check practice.

Charge to one, send to another, purchased by a third.

Personal appearance: Shoes, hands, nails.

Cotton: Conditions necessary to its growth. Amount of world's product. United States's share. Money value. Varieties of cotton and their use.

Outside Work:

Written paper on "My first day's experience in a store."

Pupils may bring to class at least two striking advertisements which offer some special inducements to change customers.

Reading assignment, with special reference to cotton growth.

Some recent newspaper articles on cotton.

SEVENTH WEEK.

Classroom work:

Sales-check practice.

Need for arithmetic in stores.

Cotton! Shipping ports and cotton markets. Transportation routes. Boston as cotton center. Manufacturing centers here and abroad. Cultivation of cotton.

Outside work:

Written paper on "Honesty."

Newspaper clippings on market fluctuations in cotton.

Reading assignments, with special reference to working conditions in cotton centers, slavery, Civil War, etc.

EIGHTH WEEK.

Classroom work:

Parents' day: Discussion of opportunities in retail establishments.

Developing speed and accuracy in arithmetic, with sales-check practice.

Drill on hard combinations. Adding 9's—adding by 10, subtracting 1.

Cotton: Cultivation of cotton. Connect with quality and price of merchandise. Harvesting, ginning, baling, shipping, breaking, carding, combing.

Outside work:

Pupils may bring to class some actual store problems in arithmetic.

Reading assignment: One article on store system from Women's Wear or Dry Goods Economist; Government bulletin on "Enemies of successful cotton growing"; Story of Eli Whitney.

Drawing a map of cotton-producing States in United States.

NINTH WEEK.

Classroom work:

Sales-check practice. C. O. D. Part paid C. O. D.

Arithmetic: Subtraction, counting back change.

Chamber of commerce rules on C. O. D. National request for elimination of C. O. D. sales.

Cotton: Spinning and weaving, warp and woof threads, finishing processes, mercerization.

Outside work:

Investigation of what has been done to eliminate C. O. D. sales.

Investigation of the activities of the Boston Chamber of Commerce.

Reading assignment, with reference to recent inventions and improvements in cotton manufacture and cotton machinery in textile papers.

TENTH WEEK.

Classroom work:

Sales-check practice. Returned goods.

Store conduct: Importance of right attitude, (1) favorable impression on employers, (2) attracts customers, (3) increases self-respect, (4) leaves mind free of concern for trivial matters.

Cotton: Pointing. Cretonnes. Tests to determine quality of cotton.

Study of finished product from sample of staple cotton materials.

Outside work:

Rules governing the return of merchandise in local stores.

Written paper on "What is required of me when I go to work."

Reading assignment: Articles in textile magazine on "Printing of cottons."

Simple tests on quality of cotton samples in chemical or physical laboratory. (Preferably at a time when other teachers may help in the experiments.)

ELEVENTH WEEK.**Classroom work:**

Discussion of store experience.

Personal appearance: Jewelry, care of body, complexion, exercise, recreation.

Cotton: Study of finished materials.

Outside work:

Store rules governing dress.

Positions in stores which may be held by pupils of high-school age.

Collection of samples at home of materials discussed in class.

Mounting samples in notebooks, with description of each sample.

TWELFTH WEEK.**Classroom work:**

Sales-check practice. Discussion of store experience. Meaning of cooperative courses. The Smith-Hughes bill.

Courtesy: How to direct customers. Rules for answering telephone.

Cotton: Written review.

Outside work:

Written paper on "Vocational Training Courses in Massachusetts."

reading assignment or trip to market. Noting system, care of stock, display, prices. If possible, this trip should be under the direction of the teacher.

Store practice Friday and Saturday.

THIRTEENTH WEEK.**Classroom work:**

Sales check practice: Importance of accuracy in making change. Practice in counting back change.

Arithmetic—subtracting credits.

Inventories.

Store directory.

Opportunities for merchandise. Study during December store experience. Discussion of merchandise.

Loyalty to school: Recognition of responsibilities toward school and store.

Outside work:

Investigation of the "cash register" and other systems of handling money.

Store assignment for system instruction.

Reading assignment in current trade papers on Christmas merchandise.

FOURTEENTH, FIFTEENTH, AND SIXTEENTH WEEKS.

Two weeks will be devoted to store practice with "follow-up" work by the teacher in charge.

Vacation of one week. Pupils may work in stores at this time if they choose to do so.

SEVENTEENTH WEEK.

Classroom work:

Discussion of store experience with relation to personal development of each pupil:

Perseverance.
Earnestness.
Reliability.
Sincerity.
Optimism.
Naturalness.
Americanism.
Loyalty.
Initiative.
Tidiness.
Yearning.

Outside work:

Written report of store work for the two weeks preceding Christmas.
Three-day assignment.

EIGHTEENTH WEEK.

Classroom work:

Importance to the store of doing careful work as examiner, bundle clerk, stock assistant, shipping clerk, receiving-room assistant.

Arithmetic drill, Store problems given. Example: 9 yds. @ $87\frac{1}{4}$ ¢ yard.
Store directory—first floor sections.

Discussion of articles of cotton merchandise handled during store experience.

Advantage offered in a stock position for the study of textiles.

Written test.

Outside work:

The duties of an examiner.

Written paper on "How I cooperated with someone else in my store work."

The list of articles of merchandise made of cotton.

Assigned reading on wool.

NINETEENTH WEEK.

Classroom work:

Arithmetic drill. Short cuts for multiplication by 5; multiply by 10, divide by 2.

Store discussion. Making the best of one's self, becoming and suitable clothes, right attitude, thinking "big," friends and their importance.

Wool: Why knowledge of wool is necessary to successful selling. Sources of supply. The sheep. Other wool-bearing animals, camel, goat, llama, vicuna, etc.

Outside work:

The duties of a stock person.

Articles of merchandise made of wool.

Reading assignment on sheep raising.

TWENTIETH WEEK.

Classroom work:

Some opportunities for boys in "transportation." Duties of traffic manager.

Classroom work—Continued.

Arithmetic drills: Multiplication by 11. Example: 27×11 . Put down right-hand figure 7, add first and second figures 2 and 7, put down left-hand figure, 297.

Receiving, unpacking, "checking" up with original orders.

Wool: Production of. Countries producing. Characteristics of fibers. Importance of wool correlated with hygiene.

Outside work:

The positions in receiving room open to "juniors."

Clippings on wool raising in United States.

A visit to chamber of commerce or board of trade wool exhibit.

TWENTY-FIRST WEEK.*Classroom work:*

"The merchandise stream." Duties of positions open to boys and girls in handling merchandise before it is placed on sale.

Invoices.

Arithmetic: Multiplication by 19. Call it 20 and subtract. Multiplication by 29, 39, etc.

Marking. Tickets, tags, pin-ticketing machines.

Wool: Camel's hair. Countries producing. Characteristics and uses of animal and fiber. Goat hair; angora, cashmere, vicuna, llama.

Outside work:

Visit to a receiving and marking room and written report of store visit.

Visit to Jaeger's store for study of raw materials.

Reading assignment on goats of South America, Asia, and United States.

TWENTY-SECOND WEEK.*Classroom work:*

Importance of items appearing on stock tickets: Price, size, house, style.

Arithmetic drill: Multiplication by 69, 79, \$1.19, etc. Receiving-room arithmetic.

"The merchandise stream."

"The personnel stream."

Wool: Shearing the sheep, sorting, baling, and marketing.

Outside work:

Reading assignment on marking stock tickets in System or other trade papers; on wool production.

Picture and clippings on sheep shearing.

Written paper on local market scenes.

TWENTY-THIRD WEEK.*Classroom work:*

Care of stock.

Arithmetic: Beginning fractions, units of measure, dozens, dollars, yards. Various ways of writing fractions. Fractions used in stores: $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{8}$, $\frac{3}{8}$, $\frac{5}{8}$, $\frac{7}{8}$, $\frac{1}{16}$, $\frac{3}{16}$, $\frac{5}{16}$, $\frac{7}{16}$, $\frac{9}{16}$, $\frac{11}{16}$, $\frac{13}{16}$, $\frac{15}{16}$.

"Lincoln" merchandise. books, pictures, bronzes, portraits, book ends, post cards, etc.

Wool: Sorting, scouring, drying, burring, oiling, blending, carding, combing, drawing, spinning, winding, dyeing, in yarn, weaving. (Discuss each process for woolens and worsteds.)

Outside work:

Written paper on "The effects on the customer of good stock keeping."

Assigned reading on "Lincoln;" on wool manufacturing processes; on wool spinning in colonial days, also modern spinning, in trade papers, etc.

TWENTY-FOURTH WEEK.

Vacation. This period may well be spent in store practice. Spring business will just be opening and opportunity will be given for store work under normal business conditions.

TWENTY-FIFTH WEEK.**Classroom work:**

Arithmetic: How to find $\frac{1}{2}$ of anything. Ways of writing one-half. Drill on $\frac{1}{2}$. Finding $\frac{1}{2}$ of yard, dozen. Drill on $\frac{1}{2}$, $\frac{1}{4}$, etc.

Care of stock: Drug stock, dry-goods stock, department-store stock. Discussion of store observation.

Wool: Review of woolens and worsteds.

Discussion of clippings obtained from trade papers.

Outside work:

Observation trip to study stock keeping in meat, grocery, and dry goods stores near your homes.

Clippings for bulletin board, on woolens and worsteds.

Visit to an industrial workshop, or an institution for the blind.

TWENTY-SIXTH WEEK.**Classroom work:**

Arithmetic: Finding $\frac{1}{4}$ of anything. Review $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$. Finding $\frac{1}{4}$ of a yard, dollar, dozen. Drill on $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, etc.

Courtesy.

Service.

Discuss Government use of woolens. Effect upon prices and supply.

Wool: Finishing processes. Inspecting, burling, washing, rinsing, shearing, tentering, measuring, pressing, putting into bolts.

Outside work:

Investigation of positions which are in "service departments."

Assigned reading in trade papers and newspapers.

Clipping on finishing processes cut from trade papers.

TWENTY-SEVENTH WEEK.**Classroom work:**

Arithmetic: Finding $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$. Review. Service features v. convenience. Service features in the store.

Wool: Special finishes. Shoddy. Increased use of shoddy. Mungo. Extracts. Flocks, pulled wool, waste fiber.

Outside work:

Advertisements which offer use of service feature to the public. Samples of material which is "shoddy." Investigation of directions for washing woolens.

TWENTY-EIGHTH WEEK.**Classroom work:**

Arithmetic: Finding $\frac{1}{4}$, $\frac{1}{2}$ yard, dozen, dollar. Review.

Debate: Clerical positions v. store positions.

Wool: Study of finished products from samples of staple wool materials.

Outside work:

Preparation for debate.

Written paper on "The advantages of a store position."

Look up and identify 10 samples at home.

Make a list of all popular material on the market for spring.

TWENTY-NINTH WEEK.

Classroom work:

Arithmetic: Finding $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$. Drill on fractional parts of yards and dollars.

Discussion of store experiences. Keeping appointments. Rules for store employees.

Lecture on "minimum wage" or discussion of application for work.

Study of fabrics that will dominate the spring fashions.

Discussion of experience in washing wool materials. Rules for washing.

Good Friday. Pupils may work in stores Friday and Saturday before Easter.

Outside work:

Pupils may make application in some store for work Good Friday and Saturday before Easter.

Advertisements from local stores featuring new materials.

Assigned reading in reference books on merchandise.

THIRTIETH WEEK.

Classroom work:

Keeping cash accounts. Personal cash accounts. Budgets. How to live on the minimum wage paid to store employees.

"Cooperation," the fundamental of highest and best work.

Arithmetic: Meaning of percentage; where used in the store; methods of finding it and ways of writing it.

Spring suits for misses.

Fashion magazines. Pattern service. Patterns, manufacture and sale.

Outside work:

Assigned reading on wages for workers. Clippings for bulletin board on "cooperation." Bring copies of fashion magazines to class.

Pupils may make up a complete outfit for their own wear, giving cost and illustrations of each article of clothing.

THIRTY-FIRST WEEK.

Classroom work:

Arithmetic drill on 1% of anything.

Words with which one must be familiar in billing position.

Spelling lesson on words used as a biller.

Wool: Adulterations. Materials and methods. Felting and shrinking. Felts, velours.

Interpretation of clippings from trade and textile papers.

Outside work:

Complete list of words used in billing.

Study for review.

THIRTY-SECOND WEEK.

Spring vacation:

Pupils may work in stores during vacation week. During this period attention should be called to the opportunity for learning about seasonable merchandise when spring business is at its height, also the need for frequent "turnovers" because of the style element and the close margin of profit.

THIRTY-THIRD WEEK.

Classroom work:

Arithmetic drill on 10%, 2%, 5%, 3%, 4%.
 Use of telephone. The "O. K. telephone."
 The cash register.
 The voice: Its cultivation and value in business.
 Service positions on floor for boys and girls. Duties of these positions.
 Oral review on wool.
 Written review on wool.

Outside work:

The entire time allowed for home work may be devoted to preparation of merchandise paper.
 See list of topics to be assigned to third-year pupils.

THIRTY-FOURTH WEEK.

Classroom work:

Arithmetic drill on 20%, 25%, 50%, 10%, $33\frac{1}{3}\%$, $4\frac{1}{2}\%$ interest, $1\frac{1}{2}\%$ commission, $1\frac{1}{2}\%$ discount.
 Conservation of supplies. Duties and responsibilities of positions in supply department.
 Personal appearance with *inspection*.
 Discussion of current events, both national and local.
 Materials used in automobile furnishings, linings, and upholstery.
 Automobile accessories, including those made of wool, metal, and leather.

THIRTY-FIFTH WEEK.

Classroom work:

Arithmetic drill on fractions and percentage.
 Food values and diet for business people.
 Where to eat when working. Discussion of apportionment of wages for food.
 A practical suit or dress for the summer. The care of summer clothing.
 Spelling: Names of local summer suburban residence places.

THIRTY-SIXTH WEEK.

Classroom work:

Arithmetic with sales check practice.
 Various forms and ways of making application for positions in stores.
 Practical exercise: Making application for a position. (The teacher will act as employment manager of a local store.)
 English: Making application for a position by letter in answer to "ads" observed in local papers.

THIRTY-SEVENTH WEEK.

Classroom work:

Education: Training necessary to do effective store work.
 Discussion on "profit sharing."
 Written review on store topics.
 "Chinese jade jewelry." Pupils' papers. Class discussion.
 "Cedar chests." Pupils' papers. Class discussion.
 Discussion of merchandise which pupils have handled while at work in stores. Duties of clerical assistant to buyer, sometimes called "merchandise clerical."
 1. Keeping running record of stock.
 2. Checking merchandise received with order and invoice.
 3. Helping buyer to plan orders.
 4. Planning letters or dictating letters relating to special orders, wrong merchandise, merchandise which has failed to come, or merchandise which has arrived in a damaged condition.

THIRTY-EIGHTH WEEK.**Classroom work:**

Advertising: Nature of work which may be done by boys and girls. Discussion of kinds of advertising in daily papers.

Loyalty: Sense of fair play. The square deal. Cooperation.

Recreation and the use of leisure time.

Memorial Day.

THIRTY-NINTH WEEK.**Classroom work:**

Sales-check practice. Small stores, subway stations, fruit stores, etc.

Discussion of store experiences.

Discussion—relation of expenditure to income.

"Samplers." Pupil's paper. Class discussion.

"Stationery." Pupil's paper. Class discussion.

"Sport clothes." Pupil's paper. Class discussion.

FORTIETH WEEK.**Classroom work:**

"Each employer a representative of the firm to the shopping public." Class discussion.

Lecture on "Vocational education."

Future possibilities of a job in a store. The importance of a summer vacation well spent.

"Vocational intent." A true ambition to advance and an ideal toward which to work.

Exhibition of textile notebooks, also merchandise papers, for parents and pupils.

FORTY-FIRST WEEK.**Classroom work:**

Discussion of summer opportunities for store work. "Blessed be the man who has found his work."—Carlyle.

Holiday.

Discussion of store work. The need for mature judgment. Overcoming parental prejudice. The influence of association. Assignment of summer work.

Discussion of notebook.

Note.—Pupils may work in stores during summer months and keep accurate account of their days of work, kind of experience, and amount of money earned. Credit will be allowed for summer work.

SENIOR YEAR.

Salesmanship and Store Organization, First Period; Store Practice and Store Mathematics, Second Period.

FIRST WEEK.**First Period.****Classroom work:**

Organization of class, with discussion of year's plans. Discussion of summer work in store positions. Sales-check practice, with attention to legible handwriting and spelling. "The cash take" sale. The floor manager's "O. K." Charge and take with coin. Necessity for courtesy in dealing with charge customers.

First Period—Continued.**Outside work:**

Written account of summer's work or written account of experiences as a customer. Assigned reading and clipping in trade papers. Beginning of a "system" book in which sample sales checks will be posted. Making of cash take sales check for system book. Making of charge and take with coin sale for system book. List of floor manager's O. K.'s. (Pupils may begin this list and add to it as their knowledge increases.)

Second Period.**Classroom work:**

Review of textile work of junior year. Books to be used for reference in study in textiles. Some new fall fabrics shown in men's clothing, also women's wearing apparel. Linen: Discussion of facts concerning use of linen in ancient times; history of linen fabrics.

Outside work:

Assignment of reading and clipping in trade papers which have accumulated during summer vacation. Investigation and collection of samples of new materials. Reading assignment on linen and on history of linen.

SECOND WEEK.**First Period.****Classroom work:**

Store discussion. The relation of good school work to good store work. The matter of records and grades. The latest developments in the field of training for retail selling. Class discussion on the meaning of efficiency. Sales-check practice, charge and take without coin, discussion of charge business and strictly cash business.

Outside work:

Reading assignment in trade papers with collection of clippings for class use. Trip through shopping room of some local store. Making of sales check for charge and take without coin sale.

Second Period.**Classroom work:**

Linens: the countries producing; climate; conditions; flax raising for fiber and seed; flaxseed, uses, market quotations; flax growing and harvesting in the United States; flax growing and harvesting in foreign countries.

Outside work:

Reading assignment on flax raising. Investigation of markets and methods of shipping grain. Written paper on inventions affecting the flax growing industry.

THIRD WEEK.**First Period.****Classroom work:**

Parents' day. Speeches showing the course in retail selling, also the opportunities for boys and girls in field of retail distribution. Discussion: What shall be taken into consideration when applying for a position? Actual application for position, the teacher acting as employment manager, giving each pupil a personal interview. (Continued until all the class has applied.) If possible, an employment manager from some local store may assist in this exercise. Sales check practice: "Charge and send to same address." Dress and personal hygiene. Care of the teeth.

First Period—Continued.***Outside work:***

Reading assignment, preferably something which can be read aloud at home in order to show opportunities in retail field. Pupils will make an application for work in a local store, noting all points discussed in class. Written list of all points to be kept in mind when making a favorable application.

Second Period.***Classroom work:***

Linen: drying flax; rippling; retting; discussion of photographs and other illustrative material collected by pupils; retting in Belgium.

Outside work:

Reading assignment on machinery used in drying; assignment in Textile Journal. Reading assignment on retting and in textile reference books. Investigation of photographs and clippings.

FOURTH WEEK.**First Period.*****Classroom work:***

Dress and personal hygiene: Care of the hair; care of the hands; care of the feet. Sales check practice: "Charge to one, send to another, purchased by third." Correction of notebook. Personal appearance. "Inspection day."

Outside work:

Written analysis of needs of each pupil regarding care of their own hair; care of their own hands. Investigation of shoes and footwear suitable for business. Making of sales check for system book. Investigation of floor manager's "O. K.'s."

Second Period.***Classroom work:***

Linen: Retting in Russia. Correlate with history and commercial geography; drying; scutching; hackling.

Outside work:

Reading assignment. Industrial history. Trip to museum to study flax tools.

FIFTH WEEK.**First Period.*****Classroom work:***

Sales check practice; "Employee's charge," with arithmetic review. Requirements for the position of selling. Duties of a selling position. Debate (parents to be invited). Resolved, That a selling position is more broadening than an office position. Discussion of clippings on "store system."

Outside work:

Written list of requirements of a selling position. Preparation for a debate. Copying of debate points in notebook. Review of multiplication tables.

Second Period.***Classroom work:***

Linen: Spinning; hand spinning. "picks of yarn." Discussion of articles of merchandise in connection with "hand spinning."

Outside work:

Reading assignment on spinning machinery. Investigation for material in trade papers which refers to spinning.

SIXTH WEEK.

First Period.

Classroom work:

Sales-check practice: "Preferred charge." The development of personality. The law of *self-mastery*. Practical test on personal appearance with inspection. "Goods on approval." Arithmetic drill in rapid addition and multiplication.

Outside work:

Making of sales check for system book. Memorization of law of self-mastery. Improvement of points noted on inspection day.

Second Period.

Classroom work:

Linen: Merchandise lesson on handkerchiefs; weaving damask, double damask; birdseye; fisheye; pheasant's eye; study of finished products with samples.

Outside work:

The time given to home lessons from now to end of the term may be devoted to writing merchandise papers on assigned topics. (See suggestive list.)

SEVENTH WEEK.

First Period.

Classroom work:

Store discussion. (Pupil's Saturday work in stores should be going on regularly.) The development of personality. "The law of self-reliance." Sales-check practice. "C. O. D." Discussion on the value of enthusiasm in selling goods. The chamber of commerce. The retail board of trade. C. O. D. allow examination. Part-paid C. O. D. Rules governing C. O. D. sales.

Outside work:

Reading assignment in trade paper. Memorization of the law of self-reliance. Making of sales check for system book. Investigation of board of trade rules for C. O. D.

Second Period.

Classroom work:

Linen: Finishing processes—beetling; study of finished product with samples; bleaching; comparative qualities of cotton and linen; simple bleaching tests. Discussion of clippings and photographs from trade papers.

Outside work:

Merchandise papers.

EIGHTH WEEK.

First Period.

Classroom work:

Discussion of store experiences. The development of personality. The law of self-improvement. Sales-check practice: "Even exchange; uneven exchange, (1) for lesser-priced goods, (2) for higher-priced goods." Discussion of opportunities for service when making exchanges for customers. Written review on the sales book.

Outside work:

Making a list of articles of merchandise sold in men's furnishing section. Memorization of the law of self-improvement. Making of sales check for system book.

Second Period.***Classroom work:***

Reading from reference books on bleaching green in Ireland and Scotland. Linen: Study of finished product from samples, towels and toweling, union towels, study of finished product from samples, Terry cloth, sheets and pillowcases.

Outside work:

Merchandise papers.

NINTH WEEK.**First Period.*****Classroom work:***

Discussion of store experience, emphasizing the need for absolute honesty. The development of personality, the law of reliability. Sales-check practice with arithmetic drill. Care of stock. First-floor departments. "Approach to customers": (a) The appeal of attractively-arranged merchandise. (b) The appeal made by the sales person.

Outside work:

Reading assignment: The life of some great man who has exhibited strong character traits. Memorization of the law of reliability. Observation trip, noting stock, care, and arrangement. Pupils may make a list of suggestions for attractive "approach."

Second Period.***Classroom work:***

Linen: Present vogue in table linens, the breakfast table (correlate discussion with work in domestic courses), the luncheon table, the dinner table. Mounting samples and correcting notebooks.

Outside work:

Merchandise papers.

TENTH WEEK.**First Period.*****Classroom work:***

Discussion of store experiences. The development of personality: The "law of good sportsmanship." Sales-check practice: "Refunds;" printed forms used with the sales check; "credit;" types of customers. The psychology of a sale.

Outside work:

The complete list of floor manager's "O. K's." required in local stores. Memorization of the law of good sportsmanship. Reinvestigation and collection of printed forms in assigned stores. Making of sales check for system book, showing "refund" and "credit." Listing all types of customers discussed in class.

Second Period.***Classroom work:***

Articles of merchandise sold in department stores which are by-products: Linseed oil, paints, varnishes, linseed meal, flaxseed, linseed cakes, oil cakes; correlated with commercial geography; linoleum. Linen: Lecture on linen by buyer; a test on samples of finished product.

Outside work:

Merchandise papers.

ELEVENTH WEEK.

First Period.

Classroom work:

Discussion of store experience. The development of personality: The law of duty. Demonstration sale. Sales-check practice: The transfer or traveler; "opening an account." Merchandise lesson—games.

Outside work:

Written paper on "My most interesting customer." Memorization of law of duty. Investigation of store policy, implied and expressed. Making sales check for system book.

Second Period.

Classroom work:

Notebook work. Putting in clippings and samples. Merchandise lesson. Toys: Kinds of toys carried in local stores; toys for boys; toys for small children; education games.

Outside work:

Merchandise papers.

TWELFTH WEEK.

First Period.

Classroom work:

Store discussion. "Presenting the merchandise." Exercise in talking up merchandise. The development of personality. The law of good workmanship. Sales check practice: Rules governing the receipt of checks or money orders. Holiday (Thanksgiving). Pupils may work in stores Friday and Saturday. It will probably be necessary for pupils to begin regular December store work at this time.

Outside work:

Study of merchandise exhibited in local store windows. Memorization of law of good workmanship. Listing of 10 books suitable for boy of 10; 10 suitable for girl of high-school age.

Second Period.

Classroom work:

Books for children. Books for boys and girls. How to make helpful suggestions to people wishing to buy books. Jewelry: Divisions of jewelry section; stock to be sold.

Outside work:

Merchandise papers.

THIRTEENTH, FOURTEENTH, FIFTEENTH, AND SIXTEENTH WEEKS.

This time will be spent in local store work under direction of teacher in charge. Arrangements for this work will be made by the director of retail selling.

The time between December 25 and January 1 may be used as vacation, unless the pupils prefer to remain at work.

SEVENTEENTH WEEK.

First Period.

Classroom work:

Discussion of store experience.

Outside work:

Pupils may work in stores—holidays.

Second Period.*Classroom work:*

Merchandise papers: Reading and discussion.

Outside work:

Pupils may work in stores.

EIGHTEENTH WEEK.**First Period.***Classroom work:*

"Talking up merchandise": What the customers want to know. The development of personality: The law of teamwork. Sales-check practice: "Special delivery"; goods sent out of State; future delivery. Discussion: The feeling of confidence a sales person has who is able to talk merchandise and the pleasure this ability gives. Correlated with English. The psychology of a well-developed sale. When merchandise is appealingly talked up.

Outside work:

List of all the selling points of assigned articles of merchandise. Memorization of the law of teamwork. Making the sales checks for system book. Making a list of descriptive adjectives and good qualifying adverbs.

Second Period.*Classroom work:*

Fancy linens: Art fabrics—correlate with color and design; hand-blocked linens. The printing of cretonnes and art fabrics. Written review on art fabrics.

Outside work:

Investigation of fancy linens at home or some friend's house. Description to be brought to class. Making of a simple design for cretonne to be used for draperies. Assigned reading.

NINETEENTH WEEK.**First Period.***Classroom work:*

Sales-check practice. "Damaged goods." "Goods as is." Discussion of "tact," "discounts." Drill in arithmetic. "Why I lost sales." Discussion based on actual experiences. Demonstration sale.

Outside work:

Assigned reading: The life of a great merchant. Making the sales check for system book. Using "damaged goods" and "discount." "Overcoming lost sales."

Second Period.*Classroom work:*

Laces: Machine-made; hand-made. Illustrative material.

Outside work:

Assigned reading on lace machinery. Collection of samples of machine-made laces.

TWENTIETH WEEK.**First Period.***Classroom work:*

Sales-check practice: "Extra package enclosed": Customer's own property; C. O. D.; prices and tags removed; demonstration sale. Service: Review with restatement of principles of service to all

First Period—Continued.*Classroom work—Continued.*

customers at all times. Store policy and ideals: Illustrations from actual experience in stores. Store organization: The meaning of word organization.

Outside work:

Completion of list of floor manager's "O. K." Making of sales checks for system book. Classification of 80 leading local stores, department stores, specialty shops, etc.

Second Period.*Classroom work:*

Lace-trimmed merchandise. The development of personality: The law of kindness. Children's millinery and lace hats. Notions and small wares. Linen thread. Linen tape and laces. Interpretation of clippings from notion magazines.

Outside work:

Study of two store windows showing lace or lace-trimmed merchandise. Memorization of the law of kindness. Reference work in trade papers. Listing of notions made of linen.

TWENTY-FIRST WEEK.**First Period.***Classroom work:*

Store organization: Actual divisions of department store pay roll; the general store; the dry goods store; the speciality shop; the department store; "finance"; "publicity."

Outside work:

Copy of divisions of pay roll of typical department store in notebook. Drawing of a store plan showing first-floor departments. Preparation of a lesson on "Finance."

Second Period.*Classroom work:*

Silk: Comparison with early history of other fibers; silk culture.

Outside work:

Reading assignment: Visit to a silk factory.

TWENTY-SECOND WEEK.**First Period.***Classroom work:*

Store organization: "Merchandise"; "personnel"; "review"; "the organization centers in the sales person with a piece of merchandise before a customer." Discussion: The store as a service center. Clippings from current trade papers. Advertising: Old-fashioned form of advertising, with illustrations and clippings.

Outside work:

Study of advertisements in local papers. Reading in "System." Preparation for lesson on service. Study of "Made in America" merchandise.

Second Period.*Classroom work:*

Silks: Varieties of; clippings and photographs about silk culture. Trade-marks. "Made in America." "Imported."

Outside work:

Notebook work. Reference book assignment. Mounting of pictures in notebook. Collection of trade-marks from merchandise.

TWENTY-THIRD WEEK.

First Period.

Classroom work:

Honesty in business: Emphasis on honest advertising. Newspaper clippings. The development of personality: The law of loyalty to family. The merchant's responsibility to the community. Types of stores serving small field; community field, whole city, city and environs, nation. Types of service. Methods of distribution: (1) Direct contact with customers, (2) indirect contact by mail order or telephone.

Outside work:

Budget plan showing how each boy and girl can help the family expenditures to be fair.

Memorization of the law of loyalty to family. Reading assignment. John Wanamaker and Philadelphia. Classification of 25 Boston stores as to field they serve.

Second Period.

Classroom work:

Silk: Where produced; countries producing; exposition and attempts at silk culture in United States; manufacturing processes.

Outside work:

Geography assignment. Map making. Reading assignment.

TWENTY-FOURTH WEEK.

Vacation:

This period may be spent in store practice. Spring business is usually opening at this time and opportunity could be given for store work under normal conditions with advantage of study of new spring merchandise.

TWENTY-FIFTH WEEK.

First Period.

Classroom work:

Mail-order business: Mail-order houses; mail-order sections of local stores; duties and responsibilities of a mail-order shopper. Location of local stores. The development of personality. The law of loyalty to school.

Outside work:

Visit to mail-order section of some store. Trip through local shopping district. Written paper on observation trip made previous day. Observation trip with teacher in charge.

Second Period.

Classroom work:

Silk: Reeling; silk throwing; finishing process; boiling off or degumming; dyeing.

Outside work:

Assigned reading. Tests in dyeing silk.

TWENTY-SIXTH WEEK.

First Period.

Classroom work:

Store organization: The merchant's responsibility for having right goods at right prices for the consumer. Retailer's responsibility to the producer from whom the merchandise is bought. The producing markets. Foreign offices and markets: London, Rome, Florence, Yokohama, Paris. Plans: To provide what is wanted at a time when it is wanted.

First Period—Continued.*Outside work:*

Memorization of law of supply and demand. Assigned reading on new markets for buying underwear, particularly the Philippines. Map study and transportation routes. Correlation with commercial geography.

Second Period.*Classroom work:*

Silk: Weighting; adulterations; present-day silk markets; correlate with work on merchandising policy; Moire.

Outside work:

Simple chemical tests. Assigned reading. Map study.

TWENTY-SEVENTH WEEK.**First Period.***Classroom work:*

Stock plans: The responsibility of the sales person for the stock plan; the duties of a merchandise clerical (illustrate with fur section). Development of personality: The law of loyalty to the store. The advantages of a small retailer over a large retailer. Popular priced lines; local; illustrate with suit section. Explanation of "shoppers." Demonstration sale.

Outside work:

Making of a stock plan on which the turnover is 4½ per cent. Memorization of law of loyalty to the store. Reading assignment: "Women's wear." Preparation for demonstration sale.

Second Period.*Classroom work:*

Silk: Spun; artificial; wild; weaving; clippings from trade papers and magazines.

Outside work:

Reading assignment. Tests with samples. Reference book work. Visit to some store carrying silks from the Orient.

TWENTY-EIGHTH WEEK.**First Period.***Classroom work:*

The law of loyalty: Loyalty to the community. Debate: *Resolved*, That the sales person belongs to the "merchandise" division rather than the "service" division. The people's use of time and energy in the store. Discussion or written lesson. Economical use of supplies. Care of equipment. Air fixtures.

Outside work:

Preparation for debate. Memorization of law of loyalty to the community. Reference work.

Second Period.*Classroom work:*

Silk: Weaving; weaving by hand; written review; ribbon weaving; crepe.

Outside work:

Preparation for debate. Reading assignment.

TWENTY-NINTH WEEK.

First Period.*Classroom work:*

The relation of waste to wages. The law of loyalty: Loyalty to country. Demonstration sale. Demonstration sale discussion. Good Friday. Pupils may work in stores Friday and Saturday before Easter.

Outside work:

Preparation for demonstration sale on books. Memorization of law of loyalty to country. Silk as it is used in church robes, etc.

Second Period.*Classroom work:*

Silk; satin weave; pale fabrics; lecture on silk; physical and chemical characteristics of silk; tests for silk.

Outside work:

Reference reading. Collection of samples.

THIRTIETH WEEK.

First Period.*Classroom work:*

"Overhead." The law of loyalty; loyalty to humanity; maintaining friendly relations. "Expense." Demonstration sale. Discussion of store experience in light of permanent positions.

Outside work:

Study of advertisements showing spring goods. Memorization of the law of loyalty to humanity. Preparation for demonstration sale.

Second Period.*Classroom Work:*

The Consumers' League: Lecture on Consumers' League. Discussion of "tests" made at home and in laboratory; correlate with chemistry and physics (if possible have teachers of these subjects assist). Merchandise lesson on new materials for spring: Cotton and silk; illustrate with samples; also clippings from trade papers and magazines.

Outside work:

Study of advertisements. Reference reading; merchandise preparation for demonstration sale.

THIRTY-FIRST WEEK.

First Period.*Classroom work:*

Store system and store organization. What is a profession? The profession of selling; general discussion. Demonstration sale. Review of work on personality. The ten laws.

1. Self-mastery.
2. Self-reliance.
3. Self-improvement.
4. Reliability.
5. Good sportsmanship.
6. Duty.
7. Good workmanship.
8. Teamwork.
9. Kindness.
10. Loyalty.

Salesmanship test.

Outside work:

The entire week may be given to preparation for test and review in salesmanship and store organization.

Second Period.

Classroom work:

Lecture by buyer. Study of finished product of silk with samples.

Outside work:

The entire week may be given to preparation for test and review in store practice and store mathematics.

THIRTY-SECOND WEEK.

First and Second Periods.

Pupils may work in stores during vacation week. Attention should be called to the excellent opportunity for the study of merchandise into which the style element enters largely; also to the necessity for frequent "turnovers" because of this style element. Pupils should keep in mind the thought of permanent store positions and be planning to accept one as soon as it is possible to be excused from school for that purpose.

THIRTY-THIRD WEEK.

First Period.

Classroom work:

Preparation for demonstration sale. Demonstration sale to which parents are invited. Printed forms in use in local stores. English: How to develop forceful and pleasing speech; choice of English; suitable adjectives. The voice.

Outside work:

Preparation for demonstration sale. Collection of clippings for the bulletin board. Completion of system book. List of rules for proper voice placement and breathing.

Second Period.

Classroom work:

Written review on silk. Correction of notebooks. Merchandise lesson: Silk hosiery; silk underwear.

Outside work:

Preparation for demonstration sale. Mending hosiery. Reading assignment.

THIRTY-FOURTH WEEK.

First Period.

Classroom work:

"Beauty in objects in daily use"; correlate with color and design. "Good taste." Service to special types of customers. Demonstration sale. Discussion: Demonstration sale—the need for character analysis and understanding.

Outside work:

Reference reading in art magazine suggested by drawing teacher. Written paper on impressions at art exhibition. Investigation of new service features in local stores. Complete test of points, weak and strong, brought out by the sale.

Second Period.

Classroom work:

Mending silk: Silk for embroidery and sewing. Ramie, hemp, and sisal. Jute, pineapple, banana, etc.

Outside work:

Trip to library or one art exhibit. Reading assignment.

THIRTY-FIFTH WEEK.

First Period.*Classroom work:*

Good books a help to understand people. (May be a lecture.)
Compilation of list of goods to read by sales people for character analysis. Suggestive selling. "Substitution." Position open to high-school graduates of retail selling courses.

Outside work:

The time allowed for outside work will be given over to the consideration of permanent store positions.

Second Period.*Classroom work:*

Burlap: The making of bags and heavy wrapping materials. "Water proofing." Metal fibers. Discussion with interpretation of clippings concerning new fibers. Interpretation of clippings with notebook corrections. Merchandise positions to graduates who have shown marked interest and aptitude for textile work.

Outside work:

The time allowed for outside work will be given over to the consideration of permanent store positions.

THIRTY-SIXTH WEEK.

First Period.*Classroom work:*

Some things the new employee ought to know. Punctuality: The business point of view contrasted with school attitude. The dress regulations for summer. Some characteristics which show weakness. The value of good first impression. The floor manager's need for knowledge of character.

Outside work:

Investigation of rules for new employees. Complete record of practice work in stores. Reference reading in trade papers. Reading assignment for character reading.

Second Period.*Classroom work:*

Lecture. The manufacturing and alteration sections in local stores. Free alterations: Discussion of alteration charges. Sporting goods.

Outside work:

Notes on lecture. Visit to some alteration rooms of custom department. Reference reading. Making of a complete list of sporting goods carried in one local store.

THIRTY-SEVENTH WEEK.

First Period.*Classroom work:*

Store discussion. How to "read character." "Detective agencies." What to do when shoplifting is detected by a sales person or other employee. Concluding sales. Demonstration sale.

Outside work:

The time allowed for home lessons for the remainder of the term may be devoted to clipping important articles from trade papers and magazines which have accumulated during the school year. Part of this material should be arranged and kept for teaching material. The remainder may be given to each pupil for notebook illustrations, etc.

Second Period.*Classroom work:*

Household section: Tinware, enamel ware, aluminum, cutlery, wire goods. Merchandise: Preparation for demonstration sales. Merchandise discussion following the demonstration sale.

Outside work:

The time allowed for home lessons for the remainder of the term may be devoted to clipping important articles from trade papers and magazines which have accumulated during the school year. Part of this material should be arranged and kept for teaching material. The remainder may be given to each pupil for notebook illustrations, etc.

THIRTY-EIGHTH WEEK.**First Period.***Classroom work:*

Some "follow-up" reports of graduates of retail selling courses; discussion. Lecture on State labor laws. Demonstration sale. Recreation; the need for exercise. Holiday: Memorial Day.

Second Period.

Brushes. Bathing suits and caps. Merchandise discussion. Interpretation of clippings on textiles. Holiday: Memorial Day.

THIRTY-NINTH WEEK.**First Period.***Classroom work:*

Welfare work in department stores: Library, lunch room, hospital, baths. The need for regular exercise: How to plan for it; what the community offers for exercise and recreation. Savings accounts. Written review on salesmanship topics. Exhibition of merchandise.

Second Period.*Classroom work:*

Wages: How to get the most out of a weekly salary. Lecture on "Spending wisely." Demonstration sale. Preparation for exhibition of pupils' note books and merchandise papers. Parents, teachers, and pupils in other departments to be invited.

FORTIETH WEEK.**First Period.***Classroom work:*

Discussion: The responsibility toward the school and the department of retail selling. All pupils to pledge to help by sending in reports of their work and progress for five years after graduation. Choosing a vocation. Demonstration sale based on suitable gifts for graduation. Personal appearance. Inspection. Clippings on salesmanship subjects; interpretation and discussion.

Second Period.*Classroom work:*

Lecture: Elements which make for success in business. Merchandise preparation for demonstration sale. Discussion of suitable clothing for graduation. Discussion of demonstration sale. Clippings on merchandise and textile subjects; interpretation and discussion.

FORTY-FIRST WEEK.

First Period.

Classroom work:

Assignment of work. The need for mature judgment when choosing a position. The impersonal, objective attitude which is *professional*. The influence of friends and the power of associations. Practical application: The building up of a large "following."

Second Period.

Classroom work:

Assignment of work with discussion of duties of each position and promotional advantages. Overcoming prejudices. The value of work well done, whatever the chosen field. The necessity of standing on an individual footing, no longer under the direct guidance of the school and teachers.

APPENDIX B.

PROGRAM OF PART-TIME CONTINUATION COURSE FOR WORKERS EMPLOYED IN RETAIL SELLING STORES.

ARITHMETIC.

FIRST YEAR.

[30 minutes a week.]

1. Drill in fundamentals to develop accuracy and speed:
 - Addition: Horizontal, vertical, group work, double columns, number combinations, tally work.
 - Subtraction: Addition method, making change, deducting credits.
 - Multiplication: Tables, short methods, business methods, application to sales-check work.
 - Division: Long, short, store problems, review in connection with fractions.
2. United States money: Decimals; store problems.
3. Units of measure: Yards, foot, inch, dozen, gross, pound, ounce, quire, quart, pint, minute, month, year.
4. Fractions: Use of in store work, relation to units and to one another, store or business fractions, addition, subtraction, multiplication and division of fractions and their relation and application to store work, decimal fractions.
5. Decimals: Interpreted as a group of fractional parts whose value may be expressed in three ways. Equivalents of common and decimal fractions familiarized. Drill given in connection with fractional part of dollar.

SECOND YEAR.

[30 minutes a week.]

1. Review of previous year's work.
2. Percentage and its application to store work; interpretation as a group of fractional parts whose value may be expressed in three ways. Application to daily problems of commission, discounts, profits, mark up, reduction, interest.
3. Aliquot parts: Store problems.
4. Expense and "overheads."
5. Making out simple bills, accounting, invoices.
6. Bank checks and receipts.
7. Profit and loss, commission, discount.
8. Budgets: Personal cash discounts, per cent allowed for food, clothing, rent, amusements. Relation of expenditures to income. Savings, credit unions, saving banks, insurance, thrift stamps.

SPELLING.

[30 minutes every other week.]

Customers' names and addresses, streets, cities, towns, States, merchandise names, department names.

The choice of words for spelling lessons should be determined by the needs of the pupils in their written English. It is recommended that lists of words frequently misspelled be selected from the different store departments and assigned to the pupils and also from the results of their own written work.

HYGIENE.

FIRST YEAR.

[30 minutes every other week.]

1. Good health, necessity for, greatest business asset.
2. Personal appearance.
3. Teeth, importance and care of.
4. Cleanliness.
5. Fresh air, sunshine, ventilation.
6. Food and drink; the city's water supply.
7. Recreation, work, rest.
8. Posture, sitting, standing, walking.
9. Habits.
10. Exercise, circulation, digestion.
11. Clothing.
12. Hygiene: Personal, home, public.
13. Garbage and waste.
14. Infectious diseases: Ways of infection, means of protection.
15. Tuberculosis.
16. Colds and their prevention.
17. Mosquitoes and flies.
18. Feet and footwear.

SECOND YEAR.

[30 minutes every other week.]

1. Review of previous year's work.
2. Breathing: Nature and bad effects of dust; nose and mouth.
3. What to eat and what not to eat; suitable lunches.
4. Types and kinds of food: Purpose of, preparation of, economy in buying, and care as to wastefulness; organs of digestion.
5. Circulation: Organs; conditions for good blood.
6. Nervous system: Organs, location, functions of brain, spinal cord, and nerves. Effect of emotions; formation of a habit and its usefulness.
7. Use of coffee, tea, milk, chocolate, water; necessity for, amount of.
8. Diseases and remedies.
9. The sick room and how to care for it.
10. Germs and germ diseases.

PHYSICAL EXERCISES.

[1½ minutes a week.]

The time allowed for this subject is so short that any short exercise may be taken while the room has a complete change of air.

TEXTILES AND MERCHANDISE.

FIRST YEAR.

[24 minutes every other week.]

1. Importance and advantage of knowledge of textiles to store employees.
2. Observation and study of staple goods; cloth.
3. Fibers.
4. Spinning and weaving.
5. Raw materials; cotton, wool.
6. Manufacturing processes; cotton, wool.
7. Finished product; cotton, wool.

SECOND YEAR.

[18 minutes every week.]

1. Review of previous year's work.
2. Fundamental processes of cloth making; flax and wool wheels.
3. Inventors and inventions of the eighteenth century and the results of their work.
4. Essentials of modern spinning.
5. Classification of weaves and mounting of cloth samples.
6. Special study of wool, wool markets, sheep, sheep raising.
7. Woolen, worsted, wool tariff.
8. Study of cotton, cotton markets, prices, manufacturing centers, by-products, varieties of finished product.
9. Study of flax fiber, characteristics, manufacturing processes, finished processes, adulteration, finished product.
10. Study of silkworm, reeling and spinning silk, manufacturing processes, weighing, adulterating, finished product.
11. Study of other textile fibers.
12. Finished products of cotton, wool, silk, linen, and minor fabrics.
13. Leather: Raw material, manufacturing processes, finished products.
14. Notions, smallwares, making of pins, needles, buttons.

PENMANSHIP.

FIRST YEAR.

[20 minutes a week.]

1. Correct position of body, arm, hand.
2. Relaxation exercises.
3. Penholding.
4. Speed movements.
5. Small and capital letters.
6. Drill in Palmer method writing exercises.

SECOND YEAR.

[20 minutes a week.]

1. Review of previous year's work.
 2. Effort directed to attaining speed with each movement, good forms, correct position.
- Completion of Palmer method of business writing.

RETAIL SELLING.**ENGLISH.****FIRST YEAR.**

[30 minutes a week or 15 minutes daily.]

1. Cultivation and proper use of the voice; advantage.
2. Clear articulation, pronunciation, inflection.
3. Word building, increasing vocabulary.
4. Sentence making, construction.
5. Common errors of speech.
6. Store topics.
7. Letters: Business, friendly.
8. Formation of plurals and possessives.
9. Right word for merchandise.

SECOND YEAR.

[30 minutes a week or 15 minutes daily.]

1. Review of previous year's work.
2. Grammatical accuracy, as to—
 - (a) Construction of sentences.
 - (b) Use of the parts of verbs.
 - (c) Agreement in number of—
 - (1) Verb with subject.
 - (2) Pronoun with antecedent.
 - (3) "This," "those," etc., with noun.
3. Comparison of adjectives; adjectives for store work; discrimination between adjectives and adverbs; comparison of adverbs.
4. Use of personal pronouns.
5. Irregular verbs.
6. Written work on store merchandise, store experiences, talking points of goods, other store topics.
7. Books and reading.
8. Letter-writing: Superscription on an envelope, answers to advertisements, business notes, notes of invitations, acceptance, regret.
9. Use of dictionary.

COMMERCIAL GEOGRAPHY.**FIRST YEAR.**

[40 minutes every other week.]

1. Local Community: History, position, growth, harbor, trade, business, steamship lines, railroad terminals.
2. The State: Chief industries, cities, causes for developments of commerce, railroads and waterways.
3. Neighboring States: Manufacturing center, reasons, trade routes, foreign and domestic commerce, railroads and waterways, large cities, occupations and productions.
4. Study of commercial centers of United States; their production and distribution.

SECOND YEAR.

[40 minutes every other week.]

1. Review of previous year's work.
2. Study of settlements, their origin and development.

3. Study of typical settlement as a distributing center.
4. Industries.
5. Typical market of the world.
 - (a) United States.
 - (b) Position.
 - (c) Factors governing production.
 - (d) Highways of commerce and methods of transportation.
 - (e) Exports and imports.
 - (f) Railroads, canals.
6. France.
7. Great Britain.
8. Germany.
9. Japan.
10. South America.

CITIZENSHIP.

FIRST YEAR.

[30 minutes every other week.]

1. Citizenship: Meaning of; kinds.
2. City government: Departments, duties of each, need for, head.
3. State government: Head, State house, purpose of, State laws, how made.
4. National Government: History of, National Capitol, purpose of, head.

SECOND YEAR.

[30 minutes every other week.]

1. Observance of law and order in the family: Purpose of, treatment of contagious diseases, observance of health laws, help of city, amusements and recreation.
2. Community laws: Duties of neighbors, public health, playgrounds, libraries, advantages.
3. American Nation: National flag, advantages of being a citizen, duties and rights of citizens to our Government.
4. Law-makers, Representatives, Senators, duties of.
5. Municipal buildings, school centers. Animal Rescue League.
6. Purpose of Constitution; what national government does for its people.
7. Some great Americans.

CURRENT EVENTS AND HISTORY.

The work will suggest itself from the subject. The pupils bringing in much of the subject matter. The life history of America's great men and women is always an inspiration to the pupils.

BUSINESS ETHICS.

This subject is always most interesting to pupils and the material may be furnished by the pupils. The discussion of success and honesty in business has a most helpful, moral effect on the formation of character. Appropriate dress, personal appearance, conduct, manners, attitude toward work.

LECTURES AND EXTRAS.

[15 minutes every other week.]

The lecture period is taken up by some head of department or member of the firm, who talks to the class upon different store subjects.

BUSINESS TOPICS AND STORE PROBLEMS.**FIRST YEAR.**

[32 minutes a week.]

1. Tying knots, boxes for immediate delivery, city delivery.
2. Making change readily.
3. Duties of cashiers, bundle girls, floor boys.
4. Qualities which make for efficiency.
 - (a). Willingness to serve.
 - (b). Quickness, accuracy.
5. Wrapping of delivered goods in paper.
 - (a). With string.
 - (b). Without string.
 - (c). Use of cardboard.
6. Tying packages for parcel post, express.
7. Folding or packing suits, dresses, skirts, waists.
8. Discussion of store problems.
9. Service to customers.

SALESMANSHIP AND STORE TOPICS.**SECOND YEAR.**

[45 minutes a week.]

1. Store organization.
2. Store system.
3. Sale-slip practice.
4. Store directory.
5. Business qualifications.
6. Truthfulness in business.
7. Store courtesy.
8. Dignity and responsibility of work.
9. Relation of employee to employer and to fellow-workers.
10. Care of stock.
11. Approach to customer.
12. Talking points of merchandise.
13. Power of suggestion.
14. Demonstration sale.

APPENDIX C.

EVENING SCHOOL EXTENSION COURSE IN RETAIL SELLING.

LESSON I.

Discussion of meaning of salesmanship.

Responsibility of position of sales person.

- A. Take place of firm in meeting customers.
- B. Maintain reputation of store.
- C. Give standards of service for new people entering employ of store.
- D. Build up reputation of store for honest representation of merchandise.
- E. Sales person makes original record of all business.
- F. Maintain dignity of profession of selling.

LESSON II.

Salesmanship—giving service to every customer who comes into the store.

Service to customer begins by—

Approaching customer.

How should you receive your customer?

- A. Being a hostess in the store the sales person should welcome customer by—
 - 1. Personal appearance.
 - 2. Tone of voice.
 - 3. Facial expression inspired by right feeling.
 - 4. Good manners.

Expressions used in approaching customers.

Discussion.

Purpose of these expressions.

Means of strengthening approach.

- A. Being able to address customer by name.
- B. Knowing customer's peculiar interests.
- C. Knowing peculiarities of customer's build.

Importance of approach.

First impression.

LESSON III.

Demonstration sale.

LESSON IV.

Reason for stress upon the importance of approach to customer.

Discussion of personal feeling when a sales person has lacked interest in you or has been over anxious to serve you.

Effect of poor approach upon—

- A. Customer.
- B. Store.
- C. Sales person.

Results of good approach.

A. On customers.

Feel at home in store and with you, therefore mind free to consider merchandise.

Results of good approach—Continued.**B. On store.**

Holds old trade and builds up new through satisfied customers.

C. On sales person.

1. Customer often buys more than intended to.
2. Customer returns to *you* and *sends her friends*.

Last part of approach to customer is showing merchandise.

Meaning of term "Talking up merchandise."

- A. To explain points about the merchandise.
- B. Object: To interest customer and make her desire to possess the things shown.
- C. To increase salability.

LESSON V.

Points which a sales person needs to know in order to be able to talk up her merchandise.

- A. Quality of material.
- B. Durability.
- C. Laundering qualities.

Directions for washing materials.

D. Color.

1. Becomingness.
2. Appropriateness for purpose.
3. Popularity.

E. Style.

1. Suitability to figure.
2. Suitability for use.
3. Extreme or conservative.
4. Reproduction of imported or American.

F. Workmanship.

1. Hand or machine made.
2. Finish.

G. Labels.

Meaning and significance of labels and trade names.
Consumers' League.
"Onyx."

LESSON VI.

Demonstration sale.

Handling more than one customer at a time.

LESSON VII.

Special facts about merchandise which will interest customers.

- A. History of the article.
Where and when manufactured.
- B. Processes in manufacture.
- C. Names of material and why so named.
- D. Advance fashion features.

As knowledge of merchandise is essential in selling it, where can you gain such knowledge?

- A. From buyers, assistant buyers, and floor managers.
- B. From other sales people.
- C. From customers.
- D. From personal experience.
- E. Trade magazines.
- F. Advertisements.
- G. Store windows.

Aids in talking up merchandise.

Ability to use descriptive adjectives.

Discussion of expressions used.

Work out list of adjectives.

LESSON VIII.

Suggestive selling.

Advantage to store; merchandise which may be suggested when consumer buys articles, such as a suit, etc.

Substitution in merchandise.

Why necessary?

Value of honesty.

Attitude toward—

A. Customer returning merchandise.

B. Customer who wants samples.

C. Customer who desires to look further before deciding.

D. Customer who wishes to be directed.

E. Customer having some deformity.

F. Aged customer.

G. Timid customer.

H. Child sent to do errand.

I. Customer who comes at closing time.

LESSON IX.

Demonstration sale.

LESSON X.

Closing the sale commences when customer shows preference.

Analysis of the closing.

Narrowing the sale.

Why are sales lost?

A. Too much merchandise shown.

B. Too little merchandise shown.

C. Wrong talking points used.

D. Too much talking.

E. Stock in poor condition.

F. Indifference of sales person.

G. Interruption.

Study your lost sales, also your successful ones.

Sales slip.

Making out.

Method of verifying address.

Courtesy after sale is completed.

A. Do not lose interest.

B. Entertain her while she is waiting for change and purchase.

C. Assist in putting on wraps.

D. Thank customer.

Importance of successful closing of a sale.

A. To store.

B. To sales person.

C. To customer.

APPENDIX D.

OUTLINE OF A COURSE IN STORE ARITHMETIC.

LESSON I.

Introductory lesson.

Need for arithmetic in stores.

Operations used in store work.

1. Addition of tallies.

Addition of items when more than one is purchased.

2. Subtraction in making change.

Subtracting credits.

3. Multiplication.

4. Percentage.

Commission.

Discount.

5. Fractions—selling yard goods.

Reasons why arithmetic is hard.

Combination of 2 figures.

Finding of hard combinations.

One tally given.

Emphasis laid on speed and accuracy.

LESSON II.

Drill on hard combinations.

2	3	4	4	5	5	5	6	6	7	4
6	8	7	8	6	7	8	7	8	8	5
—	—	—	—	—	—	—	—	—	—	—

Adding of tallies.

LESSON III.

Adding of tally for speed.

Combinations of figures that make 10.

5	1	2	3	6
5	9	8	7	4
—	—	—	—	—

Several tallies given for drill.

LESSON IV.

Adding of tally for speed.

Drill on hard combinations.

Drill on 10 combinations.

Adding by 10—subtracting 1.

LESSON V.

Adding 9's.

Add 10—subtract 1.

Much drill.

Adding of tallies.

LESSON VI.

Subtraction.

Making of change.

Adding of 9's.

Tally given.

LESSON VII.

Tally.

Subtraction of credits.

Subtraction of number of yards from bolts.

Example: 10 yards on a bolt; $8\frac{1}{2}$ yards cut off. How many yards left?

Refer to inventories.

Adding 9's.

LESSON VIII.

Multiplication.

Drill on multiplication tables with cards.

Store problems given.

Example: 4 yards @ 37¢ a yard.

Tally.

LESSON IX.

Short cut for multiplication by 5.

Multiply by 10. Divide by 2.

Drill.

Tally.

LESSON X.

Multiplying by 11. Example: 27×11 .

Put down right hand figure, 7; add first and second figures (2 and 7); put down left hand figure, 297.

Drill on easy numbers as 24×11 , 36×11 , 43×11 , etc.

LESSON XI.

Drill on multiplication by 11.

More difficult combinations.

29-347, etc.

Tally.

LESSON XII.

Multiplying by 19.

Call it 20 and subtract.

Much drill.

Multiplying by 29.

LESSON XIII.

Drill on multiplying by 39, 49, 59.

Tally.

LESSON XIV.

Drill on multiplying by 69, 79, 119, etc.

Starting on cash account.

LESSON XV.

One problem with multiplication given.

Beginning on fractions.

Units of measurements.

Enumeration of different kinds.

Enumeration of those used in store.

Dozens, dollars, yards.

Different ways of writing fractions.

Meaning of fractions.

LESSON XVI.

Fractions used in store.

$\frac{1}{2}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{8}$ $\frac{3}{8}$ $\frac{5}{8}$ $\frac{7}{8}$ use most frequently.

$\frac{1}{16}$ $\frac{1}{32}$ $\frac{1}{64}$ $\frac{1}{128}$ $\frac{1}{256}$ use occasionally.

How to find $\frac{1}{2}$ of anything.

Ways of writing.

LESSON XVII.

Drill on $\frac{1}{2}$:

How to find $\frac{1}{2}$ a dozen.

How to find $\frac{1}{2}$ a dollar.

How to find $\frac{1}{2}$ a yard.

Drill on $\frac{1}{2}$ yard at —¢.

Drill on $\frac{1}{2}$ dozen at —¢.

Drill on — yards at 50c a yard.

LESSON XVIII.

Finding of $\frac{1}{2}$ yard, dozen, dollar.

Drill as on $\frac{1}{2}$.

Tally.

LESSON XIX.

Finding of $\frac{1}{4}$ of yard, dozen, dollar.

Drill.

Review of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$.

LESSON XX.

Finding $\frac{1}{4}$ yard, dollar, dozen.

Drill.

Review drill as above.

Tally.

LESSON XXI.

Finding of $\frac{3}{4}$ yard, dollar, dozen.

Reviewing of other fractions as above.

LESSON XXII.

Finding of $\frac{1}{8}$ yard, dozen, dollar.

Drill.

Tally.

LESSON XXIII.

Finding of $\frac{3}{8}$ yard, dozen, dollar.

Drill.

Tally.

LESSON XXIV.

Finding of $\frac{5}{8}$, $\frac{7}{8}$ yard, dozen, dollar.

Review 8th.

Tally.

LESSON XXV.

Finding $\frac{1}{16}$, $\frac{1}{32}$, $\frac{1}{64}$.

Review others.

LESSON XXVI.

Working with fractional parts of yards and dollar.

Example:

$3\frac{1}{2}$ yards @ $12\frac{1}{2}\text{¢}$ a yard.

$4\frac{1}{2}$ yards @ $37\frac{1}{2}\text{¢}$ a yard, etc.

LESSON XXVII.

Drill on fractional parts of yards and dollar.

Example: $5\frac{1}{2}$ yards @ $37\frac{1}{2}\text{¢}$ a yard.

LESSON XXVIII.

Drill on problems similar to above.

Pass actual sale slips to girls.

Each girl reads the problems on her slip.

Class works them out and the first girl then explains her slip.

Example:

$1\frac{1}{2}$ yards of silk @ \$2.

$\frac{1}{2}$ yard crepe @ \$0.50.

$\frac{1}{2}$ yard silk @ \$2.60.

$\frac{1}{2}$ yard pongee @ \$1.50.

$\frac{1}{2}$ yard silk @ \$2.50.

LESSON XXIX.

Continuation of last lesson.

LESSON XXX.

Same as Lesson XXIX.

LESSON XXXI.

Tally.

Meaning of per cent.

Where used in store.

Method of finding, ways of writing it.

Cash accounts.

LESSON XXXII.

Tally.

Review fractions.

Drill on 1% commission.

Drill on 10% commission.

Drill on 100% commission.

LESSON XXXIII.

Drill on 2% commission and discount.

Drill on 5% commission and interest.

Drill on 3% commission.

Drill on 4% commission.

LESSON XXXIV.

Drill on 20% commission and discount.

Drill on 25% commission.

Drill on 50% commission.

Drill on 10% commission.

Drill on $33\frac{1}{3}\%$ commission.

LESSON XXXV.

Drill on $4\frac{1}{2}\%$ interest on money.

Drill on $1\frac{1}{2}\%$ commission.

Drill on $1\frac{1}{2}\%$ discount.

Review of other per cents.

Tally.

LESSON XXXVI.

Review of fractions.

Review of percentages.

Adding of tallies.

APPENDIX E.

BRIEF OUTLINE OF TEACHERS' COURSE IN RETAIL SELLING GIVEN AT PRINCE SCHOOL OF EDUCATION FOR STORE SERVICE,¹ BOSTON, MASS.

SOCIOLOGY.

The organization of personnel in retail stores.—Lectures, conferences, readings, observation, and participation work. The social organization of personnel activities in agencies of distribution is studied with especial reference to the needs of retail stores. Among the subjects considered are public and personal health, general welfare, industrial education, the selection, advancement, and cooperative organization of employees, the public regulation of the conditions and hours of labor, the making and use of statistical and other reports.

Applied psychology.—Lectures, conferences, readings, observation, and participation work. Problems arising in business and other situations are studied with reference to the psychological factors involved in them. The interests, activities, and occupations of representative individuals are analyzed as a means of aiding the student to reconstruct her own attitude toward work and to gain greater efficiency in it.

EDUCATION.

The teaching of salesmanship.—Recitations, discussions, observation, participation work, lesson planning, practice teaching, and criticism.

Educational principles and methods in relation to the curriculum as a social growth are studied with reference to the needs of the students as learners and teachers. Especial attention is given to the bearing of scientific method and scientific management upon the training of store employees.

Textiles.—The major and minor textile fibers are studied both scientifically and from the standpoint of utility. Manufacturing processes are traced from the primitive forms to the elaborate mechanism of the present time. Students make extensive collections of silk, wool, linen, and cotton fabrics, with compilation of important facts in regard to them. Mills and factories are visited for the observation of processes, and shops and museums for the study of the finished product.

¹ This school is supported by the Boston Merchants' National Retail Dry Goods Association, and Simmons College.

APPENDIX F.

SOME OF THE CITIES AND STORES WHICH OFFER COURSES IN RETAIL SELLING AND MERCHANDISE.

CITIES.

Boston, Mass.
Cincinnati, Ohio.
Chicago, Ill.
Dayton, Ohio.
Indianapolis, Ind.
Logansport, Ind.
Los Angeles, Cal.
Newark, N. J.
New York City, N. Y.
New Haven, Conn.

Oakland, Cal.
Providence, R. I.
Richmond, Va.
Rochester, N. Y.
San Francisco, Cal.
Springfield, Mass.
Terre Haute, Ind.
Toledo, Ohio.
Waterbury, Conn.
Worcester, Mass.

STORES.

Ashton Dry Goods Co., Rockford, Ill.
L. S. Ayres & Co., Indianapolis, Ind.
L. Bamberger & Co., Newark, N. J.
Best & Co., New York City, N. Y.
Bon Marche, Seattle, Wash.
Bonwit Teller & Co., New York City, N. Y.
Broadway Department Store, Los Angeles, Cal.
H. C. Capwell Co., Oakland, Cal.
Davidson Bros., Sioux City, Iowa.
Duffy-Powers Co., Rochester, N. Y.
Eastman Bros. & Bancroft, Portland, Me.
William Filene's Sons Co., Boston, Mass.
Garver Bros. Co., Strasburg, Ohio.
Gall G. Grant Co., Painesville, Ohio.
Hahne & Co., Newark, N. J.
Hale Bros. (Inc.), San Francisco, Cal.
O. A. Hale & Co., San Jose, Cal.
A. Hamburger & Sons, Los Angeles, Cal.
Herzfeld-Phillipson Co., Milwaukee, Wis.

Hochschild, Kohn Co., Baltimore, Md.
Joseph Horne Co., Pittsburgh, Pa.
Houghton & Dutton Co., Boston, Mass.
J. L. Hudson Co., Detroit, Mich.
Jordan Marsh Co., Boston, Mass.
S. Kann Sons & Co., Washington, D. C.
E. A. Knowlton Co., Rochester, Minn.
Lamson Bros. Co., Toledo, Ohio.
Lansburgh & Bro., Washington, D. C.
LaSalle & Koch Co., Toledo, Ohio.
Lord & Taylor, New York City, N. Y.
MacDougall & Southwick, Seattle, Wash.
R. H. Macy & Co., New York City.
Mandel Bros., Chicago, Ill.
Miller & Rhoads, Richmond, Va.
O'Connor & Moffatt Co., San Francisco, Cal.
Penn Traffic Co., Johnstown, Pa.
Rike-Kumler Co., Dayton, Ohio.
Sage-Allen Co. (Inc.), Hartford, Conn.
Chas. A. Stevens & Bros., Chicago, Ill.

John Taylor Dry Goods Co.,
Kansas City, Mo.

William Taylor Son & Co., Cleve-
land, Ohio.

The Daniels & Fisher Stores Co.,
Denver, Colo.

The Emporium, San Francisco,
Cal.

The Gilchrist Co., Boston, Mass.

The Glass Block Store, Duluth,
Minn.

The Golden Rule, St. Paul, Minn.

The Halle Bros. Co., Cleveland,
Ohio.

The Edw. Malley Co., New Haven,
Conn.

The Morehouse-Martens Co.,
Columbus, Ohio.

The Outlet, Providence, R. I.

The Robert Simpson Co., Ltd.,
Toronto, Canada.

The Strouse-Hirshberg Co.,
Youngstown, Ohio.

The White House, San Francisco,
Cal.

H. P. Wasson & Co., Indianapolis,
Ind.

Weinstock, Lubin & Co., Sacra-
mento, Cal.

Woodward & Lothrop, Washing-
ton, D. C.

R. H. White Co., Boston, Mass.

Wurzburg Dry Goods Co., Grand
Rapids, Mich.

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**All communications should be addressed to
The Federal Board for Vocational Education, Washington, D. C.**

*** Emergency war training for conscripted and enlisted men.**



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BULLETIN No. 23

**HOME ECONOMICS
SERIES No. 1**

CLOTHING FOR THE FAMILY



**ISSUED BY THE
FEDERAL BOARD FOR VOCATIONAL EDUCATION
WASHINGTON**

December, 1918

**WASHINGTON
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1919**

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FOREWORD.

The home makers of this country gained from the late war a much needed lesson in how to clothe themselves and their families from the standpoint of essentials and good sense. This lesson applied, the family finds a satisfaction in living without nonessentials, in freedom from extravagance forced upon it by custom, and in the confidence and self-respect which sensible saving imparts. Such a family is an asset to the community and the country.

The purchase and care of clothing falls to the woman and she must give wise and efficient service in discharging this part of her responsibilities. Efficient service demands training, and it is with a view of furnishing the practical information needed by women in the performance of this duty that the Federal Board for Vocational Education in response to requests for simple, direct help in this direction, publishes this bulletin.

Its primary purpose, however, is to outline courses which will lead to a proper understanding of the economic and artistic standards to be observed, to develop judgment, and to further the careful and wise expenditure of money for clothing.

It is hoped that this bulletin will be useful in solving the problems which belong equally to the girl in school, in college, in business, and in home making, of how to purchase materials and how to make and select garments which will be appropriate to the needs of the family for sanitary, attractive, and economic clothing.

The course was prepared by Miss Laura I. Baldt, of Teachers' College, New York City, under the direction of the Research Division in cooperation with the Home Economics section of the Federal Board for Vocational Education. Acknowledgments are to be made to Miss Lillian Locke, of Trenton, N. J., for her assistance in the writing of the unit on Millinery, and to Miss Wenona Windsor, of the Extension Department of the University of Missouri, for her help in the arrangement and editing of the material.

C. A. PROSSER.

CLOTHING FOR THE FAMILY.

GENERAL PURPOSE OF THE COURSE.

This course is designed especially to meet the needs of part-time and evening schools and classes for a general course of instruction in the principles of clothing. The purpose of the course is to aid the women and girls of the country to meet intelligently the economic clothing situation of to-day. The keynote of the course is conservation. It is intended primarily to equip the beginner with some fundamental principles of clothing economics: (1) a knowledge of textiles, leading to a wiser selection and purchase of materials; (2) an appreciation of design, encouraging simplicity in expression; (3) training in the elementary technical processes of sewing as a preparation for more advanced work, and (4) a knowledge of the elements of care and repair of clothing.

To the woman who has already acquired a part or all of these principles as a result of experience in planning, making, and buying her own or the family wardrobe, this course is intended to give (1) a broader and more practical knowledge of textiles; (2) a better understanding and appreciation of the value of design, and (3) a greater degree of technical skill in preparing as much of her personal or family wardrobe as may seem necessary or desirable, this to include the care, repair, renovation, and remodeling of garments.

WAYS OF USING THE COURSE.

The course is purposely arranged to be very flexible in order that it may readily be adapted to the use of different groups of students whose needs vary and whose previous training is not uniform. The material included in the course may be used as suggested below for either part-time or evening schools, the arrangement of the material being determined by the specific needs of the students and by the amount of time which they can give to the work.

For part-time schools, the entire course may be used as a graded course of instruction. The material will be found ample to cover the required 144 hours. If a class is especially interested in one or more sections, these may easily be expanded and other sections in which there is less interest be condensed or even omitted entirely.

For evening schools or classes where shorter courses of instruction are desired, one or more sections may be elected by the students to fit their particular need. This makes it possible to obtain courses of any desired length or content. For students, especially those with previous training or experience, who are interested in one specific problem and who are limited in time, one or more units may be offered separately. It is manifestly unfair to ask a busy woman to complete an entire section containing several units in which she is not interested, in order to get instruction in the one unit in which she is interested. Single units should be offered only where a sufficient number of students elect the same unit. When two or more units are offered together, it is usually better to choose them from the same section, so that the amount of technical skill required will be fairly uniform. This would not be necessary in a case where the class is made up of women who have had sufficient practical experience in sewing to enable them to do the work of the more advanced unit.

An example of how several units may be combined into a course of lessons to meet a specific need will be found in the outline suggested for Lessons on Conservation of Clothing, on page 100.

In some cases where a teacher is already giving instruction to a regular class which will complete an entire section, arrangements may be made whereby other students may drop into the class for instruction in special units which they desire. This is practical only where the two groups need the same type of instruction. In such a case it will be necessary for the teacher to check up the work of the students at the completion of each unit.

METHODS OF RECRUITING CLASSES.

Women can be interested in the course of instruction in various ways—through parents' associations in day schools, through the visiting nurse, through community clubs or any organization of women, or through noon-hour visits to mills, factories, or other places of employment. Interest in the personal attire of the visitor, especially the hat and gown, if these are of the type in which instruction will be given, may be used to stimulate interest in the course.

One of the best methods of advertising the work is through clever posters or well-written newspaper articles. These should state definitely the content of the course offered and tell when and where it will be given.

QUALIFICATIONS FOR ADMISSION TO SECTIONS OR UNITS.

It is not necessary for the student who enters the beginners' section to have had training or experience in sewing. Satisfactory completion of this group of units qualifies a student for admission into the more advanced sections or units. Prospective students

who through training and experience have had the equivalent of the instruction given in the beginner's section may qualify for admission to the advanced sections or units by passing a practical test which will prove their ability to do the work. Provision is thus made for economizing the time and efforts of the experienced women and for allowing them to elect either isolated or consecutive units.

QUALIFICATIONS OF INSTRUCTORS.

Instructors in part-time and evening schools are required to have had practical experience, professional training, and training in home economics, the required amount of each being determined by the standards established in each State. Thorough training in home economics is essential. It is essential that the teacher have such mastery of the principles of teaching that she can organize her knowledge and present it clearly and effectively in the limited amount of time at her disposal. She must have had, in addition, such actual experience in home economics problems as will enable her to make her instruction thoroughly practical and to fit it to the needs and home conditions of the students.

Slightly less technical training is required for teachers of evening schools and classes than for teachers of part time schools or classes, provided that they have had exceptionally good practical training and enough training in methods to enable them to present material effectively to a class. It is possible, often, to obtain as teachers of evening classes, trained women from the trades, such as dressmakers or milliners, whose practical experience and wide knowledge of their vocation make them capable of giving excellent instruction in their line of work.

Where it is necessary, these women should be given some professional training in methods of teaching in order to make their work most effective.

EQUIPMENT.

CLASSROOM EQUIPMENT.

Following is given a complete list of equipment suitable for the entire course. Where this equipment is not already a permanent part of the classroom, all the essential pieces may be borrowed from homes or obtained elsewhere.

Cabinet.	Irons.
Desk or table.	Dress forms.
Desk chair.	Roll of manila paper (for patterns).
Mirror.	Yard sticks, 36 and 45 inches.
Blackboard.	Skirt markers.
Cutting tables.	Tracing boards (chalk).
Sewing machines.	Fashion books.
Ironing boards.	Illustrative charts.
Sleeve board.	Demonstration frame.
Tailor's cushion.	

INSTRUCTOR'S EQUIPMENT.

In addition to her necessary supply of personal sewing tools, the equipment listed below, while not essential, will be found of great assistance to the teacher, both in the preparation and in the presentation of lessons.

I. Illustrative material. (See Bibliography.)

A. Models of sections of garments and of completed garments.

B. Samples (generous size) of materials and trimmings suitable for the garments which are to be made.

C. Sheets from fashion books, circulars, or catalogues, containing cuts of simple, attractive garments which will give suggestions for good designs.

D. Photographs illustrating industries, textiles, etc.

II. Books of reference for desk use. (See Bibliography.)

III. Demonstration materials.

A. Cloth for illustrating stitches, etc.

B. Heavy paper or bits of cloth for rapid work in illustration.

Where the school does not supply the instructor's equipment, it would be wise for her to install a simple equipment and add to it from time to time. A few good sized samples of standard materials are far better than a multitude of insignificant ones; likewise a few good photographs and clippings to which others may be added gradually may form the nucleus of a fine collection. Illustrative material for a demonstration may be crude and yet serve to help the student visualize the process which is being taught.

STUDENT'S EQUIPMENT.

It should be made clear to the student at the outset that there is more economy of time, money, and patience in buying equipment made of good material. The following list contains the general equipment needed for any unit on clothing. Any other articles may be added throughout the course as the need for them arises. Any of the equipment which the student already has may be used. Articles which must be supplied will be of permanent use in the home after the course is finished.

Thimble.

Scissors, pointed ends.

Small or medium sized shears.

Buttonhole scissors.

Tracing wheel.

Tailor's chalk.

Good tape measure.

Pins.

Pin cushion.

Needles, package of assorted sizes.

Milliner's needles.

Embroidery needles.

Darning needles.

Emery.

Stiletto.

Bodkin.

White sewing cotton, assorted sizes, 50 to 100.

Colored sewing cotton for marking purposes.

Darner.

METHOD OF CONDUCTING A SECTION OR A UNIT.

In the outline, provision is made for lectures, demonstrations, class discussion, and classroom practice. A definite assignment of home work is also included. The method of combining the lecture and demonstration of a technical process and accompanying it with class discussions greatly facilitates the work of the student. Supervised classroom practice together with assigned home work trains the student in self-dependence and initiative and aids in securing skill and speed.

The teacher will note that the first lesson in each unit is an introductory lecture, discussion, and demonstration which contains subject matter applying to the entire unit. While this is combined in the first lesson for convenience, some of the points outlined may, at the discretion of the teacher, be omitted from this lesson and distributed through the remaining lessons of the unit as the need for such subject matter arises. The general discussions on the type of garment, the choice of material and design, the measurements for the purchase of pattern, and the computations of the amount of material required are points which should be covered fully in the first lesson, since they are necessary steps in the preparation for the second lesson. Other points which are not essential to the first lesson may well be deferred until later in the work. For instance, an extended discussion in decoration may be used to better advantage in a later lesson when the related process is taken up. The same thing is true of a discussion in methods of finishing a garment. The comparison of the garment made in class with the ready-made garment should usually be reserved for the final lesson when the garment made by the student has been finished and the final computations of cost of materials and the time required have been made.

There will be found in the appendix a discussion of the lesson plan which contains general suggestions as to the preparation which should be made by the teacher who is to present a unit to a class; and also an outlined lesson plan for the second lesson of Unit 1, Section IV, which shows how the subject matter and the classroom procedure may be related.

TESTS AND EXAMINATIONS.

Certain standards of proficiency must be adhered to in working out each unit of the course. The student should be made to feel that there are standards of skill, speed, and good workmanship; and that the training is given to enable students to achieve these standards rather than to pass a specific test. The important aim of the course is to train the student to be an independent worker, with the ability to estimate the value of her own work, and only tests or examinations with this aim in view should be planned. The

use of score cards for each garment completed is one of the best methods of showing the student how to estimate her work on a fair basis and how to recognize her weak points. Two types of score cards are given in the appendix. The student should also be required to make, for each finished garment, a record showing the cost of the materials, the amount of time required, and the total cost of the completed garment. Occasional practical tests and examinations are of value if planned so as to be a help to the student and not a burden nor a bugbear.

BIBLIOGRAPHY.

A complete bibliography for the course, together with suggestions as to its use, both by teacher and student, will be found in the appendix.

GENERAL OUTLINE OF SECTIONS AND UNITS SHOWING CONTENT AND APPROXIMATE NUMBER OF LESSONS IN EACH.

		Lessons.
Section I.—Beginners' Section.		
Unit 1. Chemise.....		5
Hand sewing.		
Use of patterns.		
Unit 2. Underskirt.....		5
Study of machine and its use.		
Unit 3. Bungalow apron.....		4
Unit 4. Care and repair of clothing.....		2
		<hr/>
		16
		<hr/>
Section II.—Elementary Dressmaking.		
Unit 1. Budget.....		1
Unit 2. Washable waists.....		5
Unit 3. Washable dresses—Possibilities of conservation.....		9
Unit 4. Care, repair, and renovation of washable garments.....		2
		<hr/>
		17
		<hr/>
Section III.—Advanced Dressmaking.		
Unit 1. Wool dress—Possibilities of conservation.....		11
Unit 2. Dress form.....		8
Unit 3. Party dress.....		9
Unit 4. Care, repair, renovation, and remodeling of silk and wool garments.		2
		<hr/>
		30
		<hr/>
Section IV.—Children's Clothing.		
Unit 1. Layette.....		4
Unit 2. Children's clothing—Possibilities of conservation.....		4
Unit 3. Boy's suit or substitution of child's coat.....		9
		<hr/>
		17
		<hr/>
Section V.—Millinery.		
Unit 1. The making of hat frame.....		12
Trimming hats.....		5
Unit 2. Care and renovation of hats.....		2
		<hr/>
		19
		<hr/>
Total lessons.....		99

Section I.—Beginners' Section.

The purpose of this section is:

- I. To teach, through the construction and decoration of a simple garment.
 - A. Hand sewing.
 1. Fundamental stitches.
 2. Simple decorative stitches.
 - B. Use of the sewing machine.
 1. Cleaning and oiling.
 2. Care of the machine.
 3. Treading and sewing.
 - C. Economy.
 1. Of purchases, by computing quantities of materials and trimmings.
 2. Of time and labor, through speed in cutting and assembling parts.
- II. To teach proper economic and artistic standards to be observed in the selection of undergarments, also appreciation of simplicity of design in clothing.
 - A. Appearance.
 - B. Comfort.
 - C. Materials.
 - D. Labor involved.
 1. In making.
 2. In laundering.
 - E. Cost.
 1. Homemade v. Ready-made.
 2. Home laundering v. Commercial laundering.
- III. To develop judgment.
 - A. In selection of material.
 - B. In selection of pattern.
 - C. In adaptation of pattern.
 - D. In cutting.
 - E. In making.
- IV. To aid in the campaign for conservation of clothing by teaching.
 - A. The care and repair of garments.
 1. The proper care and storage of garments when not in use.
 2. Use of tools and equipment in caring for clothes.
 - a. Brushes.
 - b. Hangers.
 - c. Covers.
 - d. Solvents and detergents.
 - e. Mending equipment.
 - f. Protective agents against moths, dust, etc.
 3. A knowledge of repair processes; darning and patching.

UNIT 1.—CHEMISE.*Lesson I: Introductory Lecture, Discussion and Demonstration.*

- I. Use of garment.
 - A. To cover body, corset, and other undergarments.
 1. Material and trimming suitable for length of service, comfort, and attractiveness.
 - B. Protection to outer garment.
 1. From friction.
 2. From soil.

II. Types—Discussion and selection.

A. Plain straight chemise.

1. Variations.

a. Set to yoke.

b. Shaped to fit at neck line.

c. Gathered to fit at waistline.

B. Envelope chemise.

III. Materials—Discussion and selection.

A. Suitable kinds.

1. Nainsook.

2. Berkeley cambric.

3. Longcloth.

4. Crêpe.

B. Advantages of each.

1. Nainsook—soft, dainty, durable, launders well, lends itself to all types of decoration.

2. Cambric and longcloth—durable, for wear with heavy outer garments or for strenuous work.

3. Crêpe — saves labor in laundering; cheap.

C. Disadvantages.

1. Nainsook—too delicate to stand heavy wear or strain.

2. Cambric and longcloth—do not lend themselves well to fine decoration.

3. Crêpe—not suitable for wear with fine garments; not so durable as the others.

(See Bibliography for all textile discussions.)

IV. Patterns.

A. Measurement for pattern.

1. Standing behind figure take easy measurement over fullest part of bust.

B. Purchase of pattern.

V. Decoration.

A. Lace edgings, insertions, and beadings.

1. Kinds.

a. Handmade.

Irish, torchon, cluny.

b. Machine made French and German Valenciennes, imitation Irish, torchon, cluny.

2. Fibers.

a. Linen—strong but expensive.

b. Cotton—less durable but cheap.

3. Advantages.

a. Dainty, easy to apply, durable if real laces or very good imitations are used.

b. Good imitations have threads running diagonally from edge to edge of lace, thus causing mesh to interlock.

4. Disadvantages.

Real lace expensive; extra care required in laundering, etc.

B. Embroidered edgings, insertions, and beadings.

1. Types.

a. Solid embroidery.

b. Eyelet and openwork

V. Decoration—Continued.

B. Embroidered edgings, insertions, and beadings—Continued.

2. Advantages.

- a. Can be secured in nainsook, swiss, batiste, or cambric—backgrounds to correspond closely to material of which the garment is made.
- b. Easily laundered.

3. Disadvantages.

- a. Not as dainty for finishing as lace.
- b. Openwork not durable.
- c. More difficult than lace to apply.
- d. Expensive form for narrow finish.

C. Handmade trimmings.

1. Tatting.

2. Crochet.

3. Embroidery.

a. Scalloping.

b. Simple decorative stitches.

(1) Satin.

(6) Lazydaisy.

(2) Blanket.

(7) Catch.

(3) Chain.

(8) French knot.

(4) Feather.

(9) Couching.

(5) Outline.

(See Bibliography.)

4. Advantages.

- a. Durable; attractive when dainty.

5. Disadvantages.

- a. Time consumed in making often more than should be spent.
- b. Tendency to overdecorate.

D. Ribbons or lingerie braid.

1. Wash ribbons preferable.

2. Colors if used should be dainty; white preferable.

VI. Design.

A. Simplicity and beauty of line and decoration.

VII. Computations.

A. Amount of material.

B. Quantity of trimming.

C. Cost of same.

VIII. Comparison with ready-made garments.

A. Advantages of each type.

B. Disadvantages of each.

IX. Purchase of material, trimmings, and findings such as buttons, thread, embroidery, cotton, and needle.

X. Equipment. (See p. 10).

Lesson II: Demonstration and Classroom Practice.

NOTE.—Home work when not specified consists in finishing the assignment for each lesson.

I. Interpreting pattern. (See Bibliography.)

A. Read all directions carefully.

B. Note the meaning of perforations and notches.

C. Identify parts as per the printed diagram on pattern.

II. Testing and altering pattern (fig. 1).

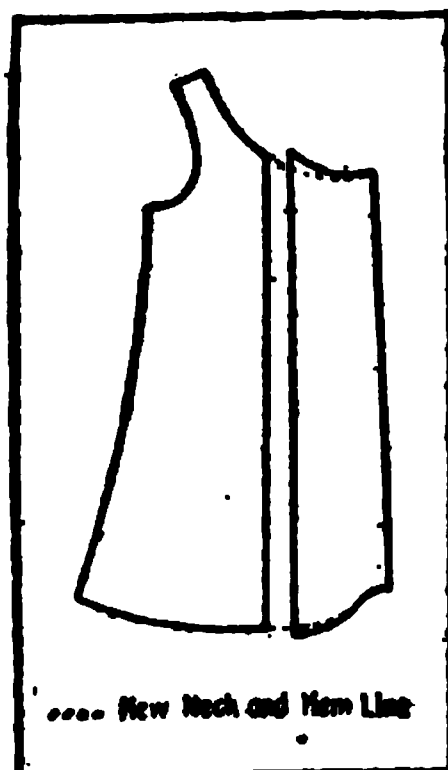


FIG. 1.—Alteration of chemise pattern; adding fullness to front.

A. Test for bust measure and length.

1. Extra fullness may be added or taken out at the center front and center back.
2. Extra fullness may be added by use of tucks.
3. In altering be sure to change the neck line so that it remains true.
4. Extra length may be added or taken out in the skirt about midway between waist and bottom (fig. 2).

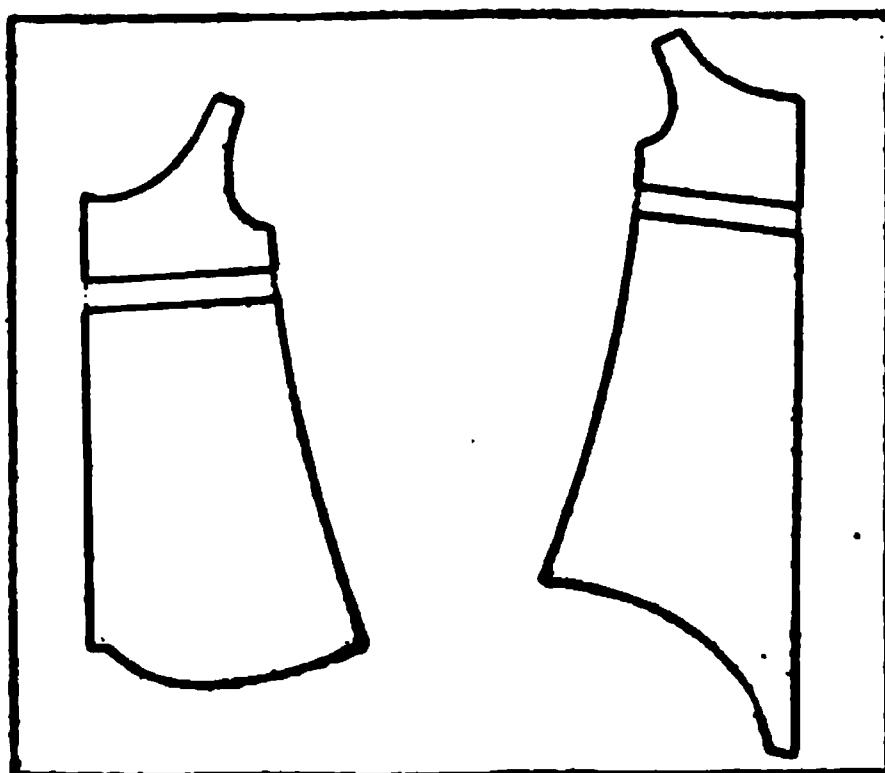


FIG. 2.—Alteration of chemise pattern; increasing length of front and back.

III. Preparation of material for cutting.

A. Shrink material before cutting. (To be done at home before the lesson.)

1. Fold material in convenient length for handling; dampen thoroughly; hang out without wringing. When nearly dry press on wrong side.

B. Straighten cut ends with woof thread.

C. Fold cut ends together and pull material until it is straight and smooth.

IV. Cutting.

- A. Note carefully the directions for cutting accompanying the pattern.
- B. Pin pattern to place.

IV. Cutting—Continued.

C. Cut around edge of pattern if seam allowance is already made.

D. All tucks and embroidery should be placed before cutting.

1. After first tuck is creased and stitched the desired width, to find the line for creasing the next one, measure from the stitching the width of the tuck plus distance desired between tucks. Stitch same distance from crease as in first case.

E. To avoid stretching the material it is best to mark the neck line lightly with tracing wheel and colored thread and only cut down far enough to admit head for fitting.

V. Marking.

A. All notches and seam markings should be marked lightly with a tracing wheel and colored thread.

VI. Basting (figs. 3a-3e).

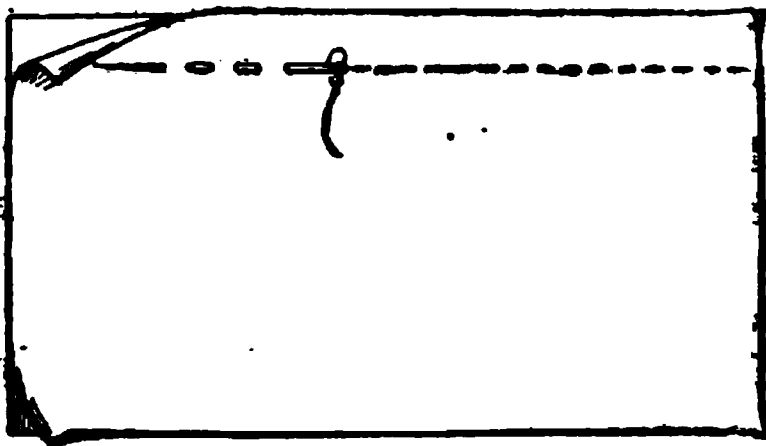


FIG. 3a.—Running stitch.

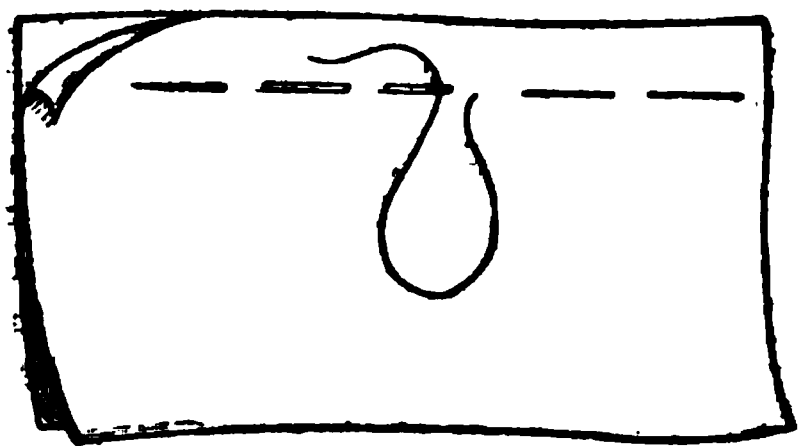


FIG. 3b.—Uneven basting.

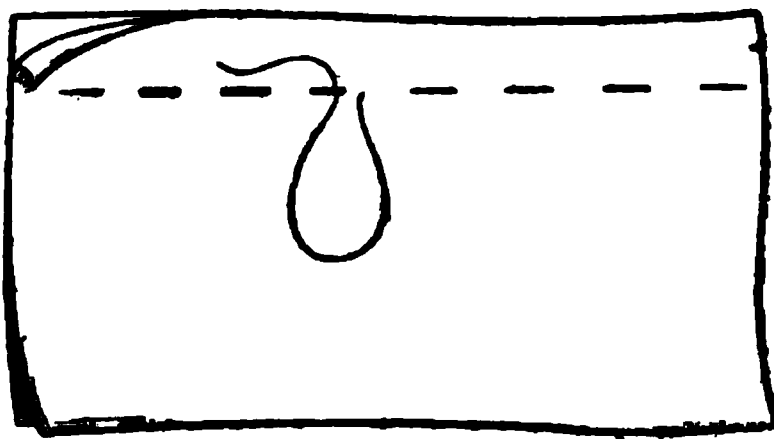


FIG. 3c.—Even basting.

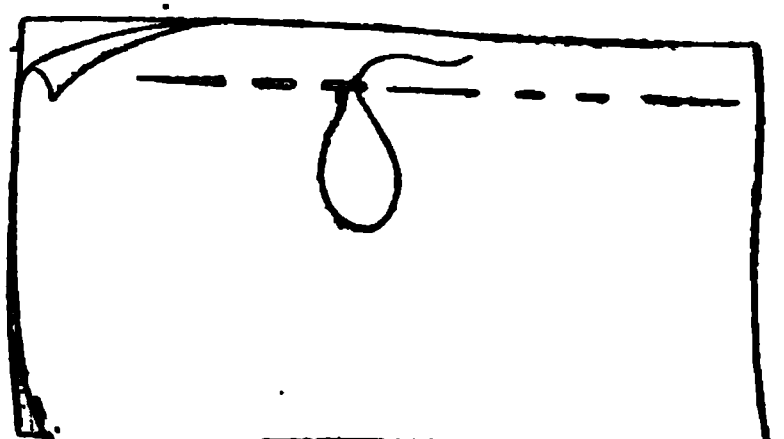


FIG. 3d.—Dressmaker's basting.

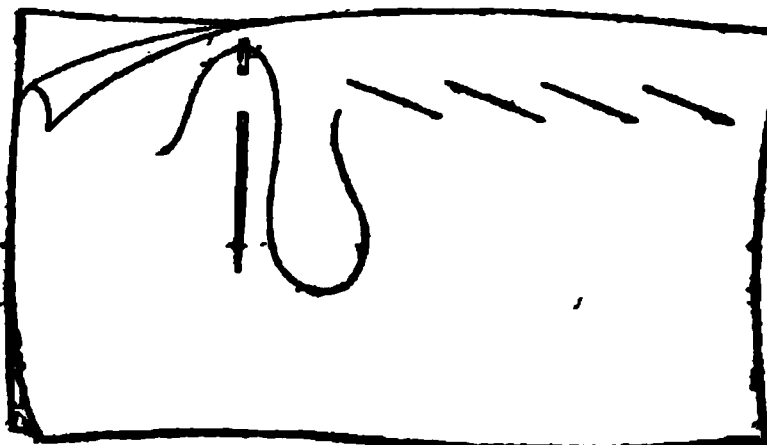


FIG. 3e.—Diagonal basting.

A. Pin seams, being careful of bias edges.

B. Baste shoulder and underarm seams for fitting (basting stitch demonstrated).

VII. Fitting (fit right-hand side only).

A. Notice fullness at hip and bust lines. Easy fit desirable with plenty of freedom for movement of limbs and arms. Alter by opening seams.

B. Notice whether neck line falls in proper place; if not, mark new one with pins. (See Bibliography.)

VIII. Alterations. (See Bibliography.)

A. Trace all lines for alterations.

B. Open corresponding seams and lay parts together. Trace alterations.

IX. Seams. (See Bibliography.)

A. Types.

1. French seam (fig. 4).

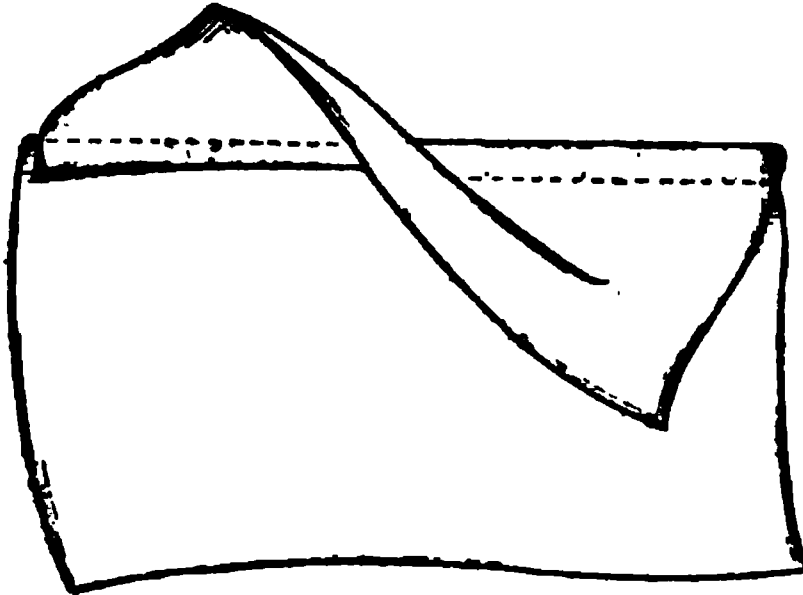


FIG. 4.—French seam.

2. Fell (figs. 5 and 6).

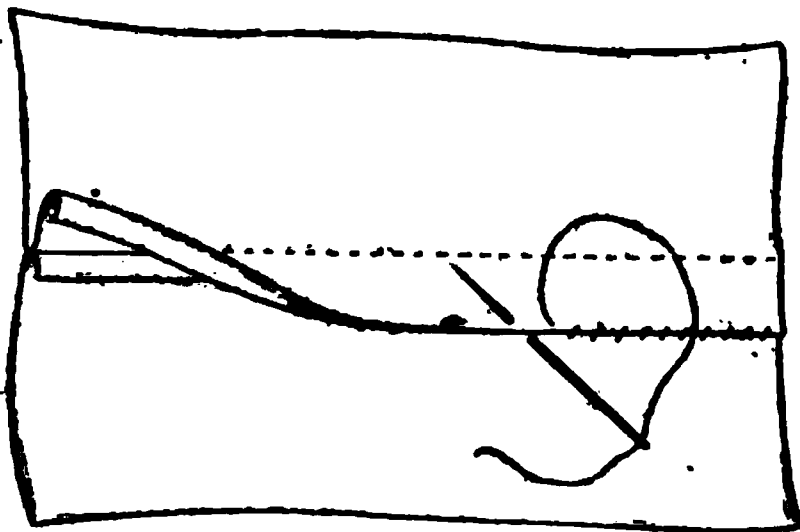


FIG. 5.—Hemmed fell.

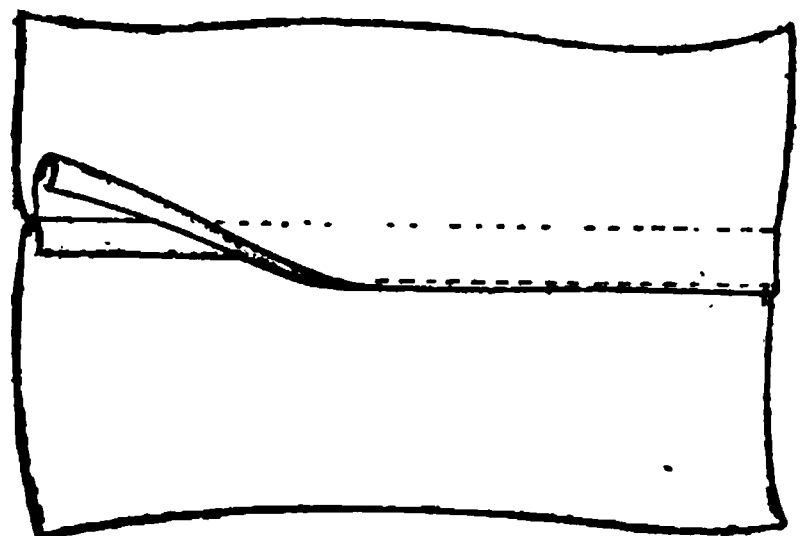


FIG. 6.—Stitched fell.

a. Hemmed.

b. Stitched.

3. Use of entre-deux.

NOTE.—In this garment use hemmed fell on shoulder seam and French seam at under arm.

B. Advantages and disadvantages of each type of seam as regards speed and difficulty in making and appearance.

(NOTE.—Hand-sewed seams are recommended in this problem as a means of teaching the elementary stitches. Where the student has previously had sufficient practice in hand sewing, machine-sewed seams may be made. In this case the material in Lessons I and II, unit 2, on care and use of the sewing machine should be introduced at this point.)

C. Methods of making seams and stitching and hemming stitches demonstrated. (Figs. 7 and 11.)

1. Hemmed and stitched fell (figs. 5 and 6) demonstrated.

a. Place right sides of material together for first sewing of hemmed fell or wrong sides together for stitched fell.

b. Trim front edge to $\frac{1}{8}$ inch and back edge to $\frac{3}{8}$ inch.c. Turn back in $\frac{1}{8}$ inch and fold down over front. Hem or stitch to place.

IX. Seams—Continued.

C. Methods of making seams and stitching and hemming stitches demonstrated—Continued.

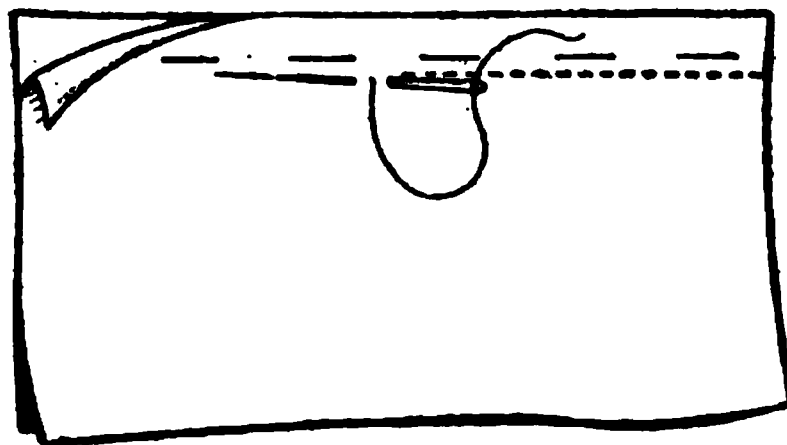


FIG. 7.—Stitching.

2. Seam finished with entre-deux.

a. Join entre-deux to both front and back seam line with fine French seams (see No. 3).

3. French seam (fig. 4) running, back, and combination stitches demonstrated.

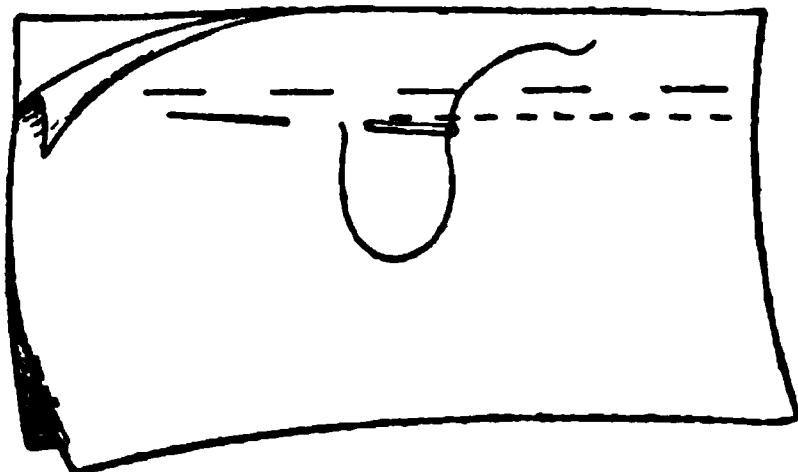


FIG. 8.—Backstitching.

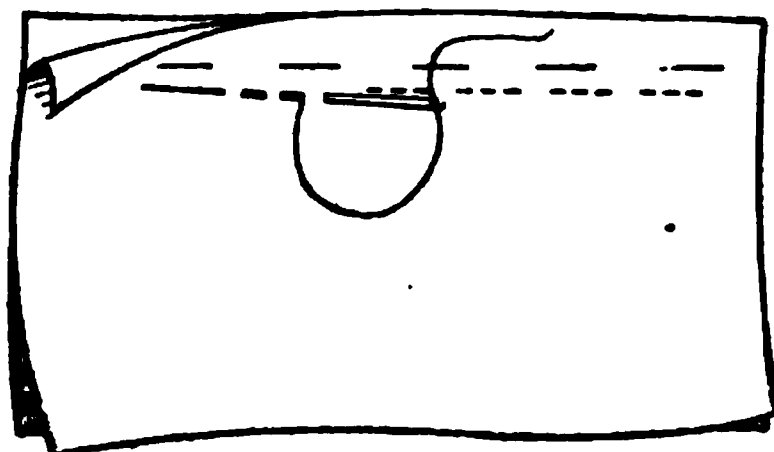


FIG. 9.—Combination stitch.

- a. Place two wrong sides together, baste and sew with either running, combination, or back stitching.
- b. Trim not over $\frac{1}{4}$ inch from seam.
- c. Turn, crease on line of sewing and, by hand, baste and stitch seam just far enough from the edge to cover the raw edges.

Lesson III: Hems, Buttons, and Buttonholes.

I. Hem (figs. 10 and 11).

A. Plain hem (demonstrate).

1. Fold material back to wrong side on line indicated for turning hem.
2. Measure from this crease down the width desired for the hem plus $\frac{1}{4}$ inch for turning under; trim evenly.
3. Turn in the raw edge, remove fullness in small darts, baste hem to place and hem.
4. On a very fine garment the hemming should be done by hand, but otherwise may be stitched.

B. If preferred, the bottom may be finished with lace or embroidery to correspond to the top.

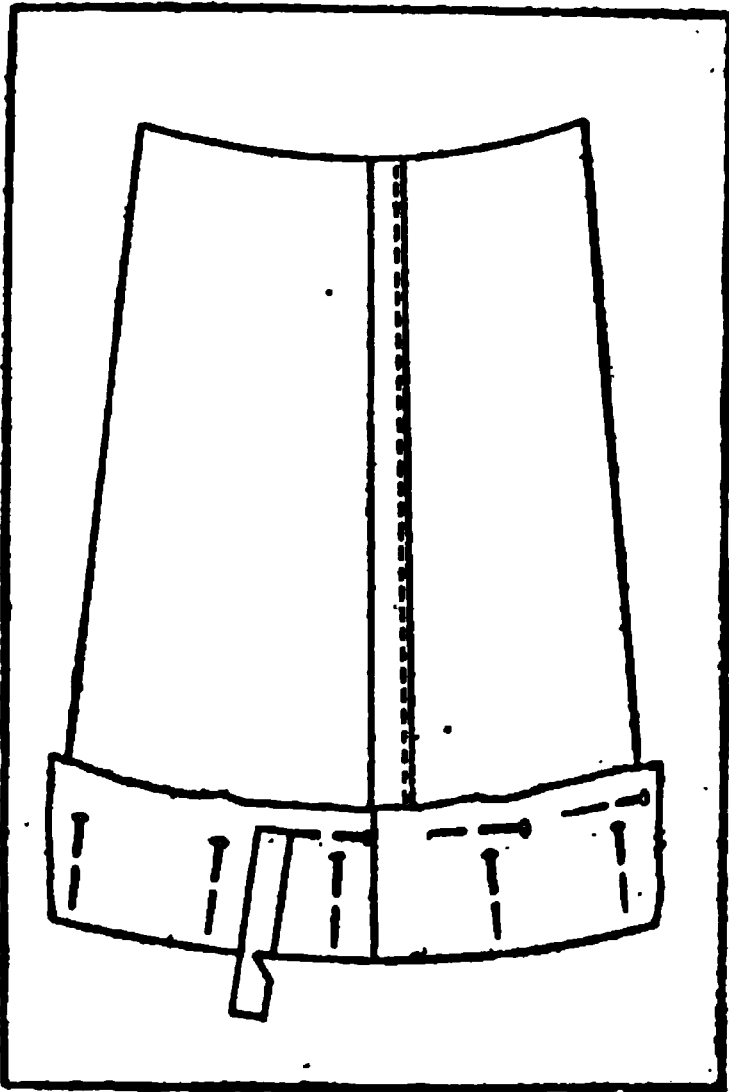


FIG. 10.—Marking hem.

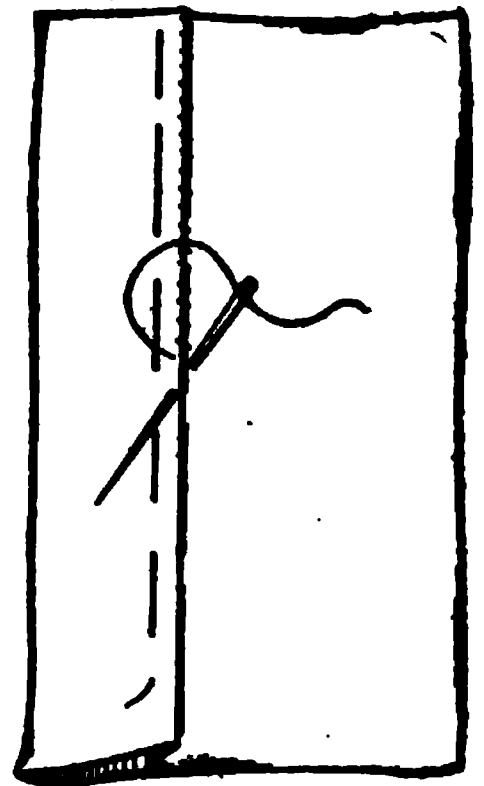


FIG. 11.—Hemming stitch.

II. Envelope closing.

A. Turn hem in lower edge of front and back where the two parts button together. Turn this hem wide enough so that buttons and buttonholes may be placed through two thicknesses of cloth. If enough material is not left for this, make faced hem.

1. Faced hem (demonstrate).

a. The facing may be cut, from either straight or bias material, the desired width of hem plus $\frac{1}{4}$ inch.

(1) Cutting bias.

(a) Bias—any diagonal cutting.

(b) True bias—diagonal formed when wool threads are folded over in such a way that they lie parallel with warp threads. This is the bias used in dressmaking and millinery.

b. Lay right sides together and sew and trim evenly.

c. Crease on this line of sewing and again $\frac{1}{4}$ inch from opposite edge.

d. Baste and hem to garment.

III. Buttons and buttonholes (fig. 12). Demonstrate.

A. Buttonhole.

1. Types.

a. Fan end.

b. Bar at both ends.

(1) Compare strength and appropriateness.

(2) Size compared to button.

2. Making (steps).

a. Mark.

b. Cut.

c. Overcast.

d. Work. (See Bibliography.)

III. Buttons and buttonholes—Continued.

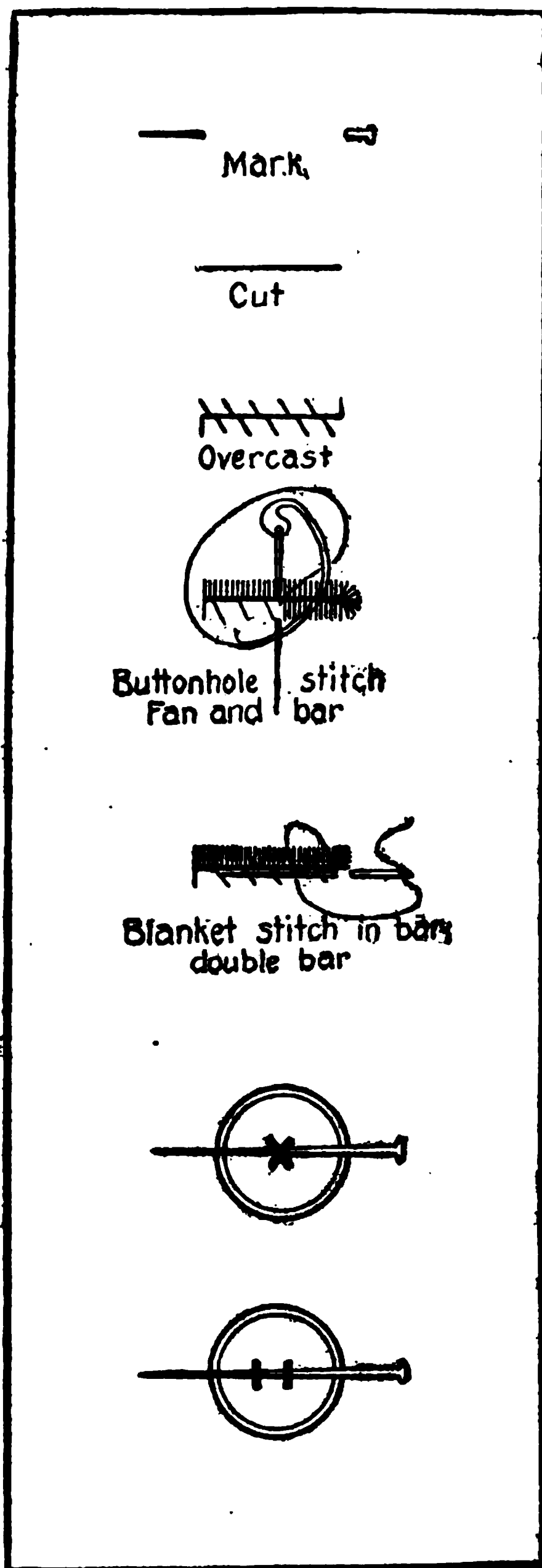


FIG. 12.—Buttons and buttonholes.

B. Buttons.

1. Type and size.

a. 2-hole—4-hole.

b. Size related to garment or part of garment.

III. Buttons and buttonholes—Continued.

B. Buttons—Continued.

2. Method of sewing on.

- a. Use pin to form neck.
- b. Conceal knot.
- c. Fasten thread.

Lesson IV.

I. Neck and armhole finish.

A. French hem and overhanding (fig. 13). Demonstrate.

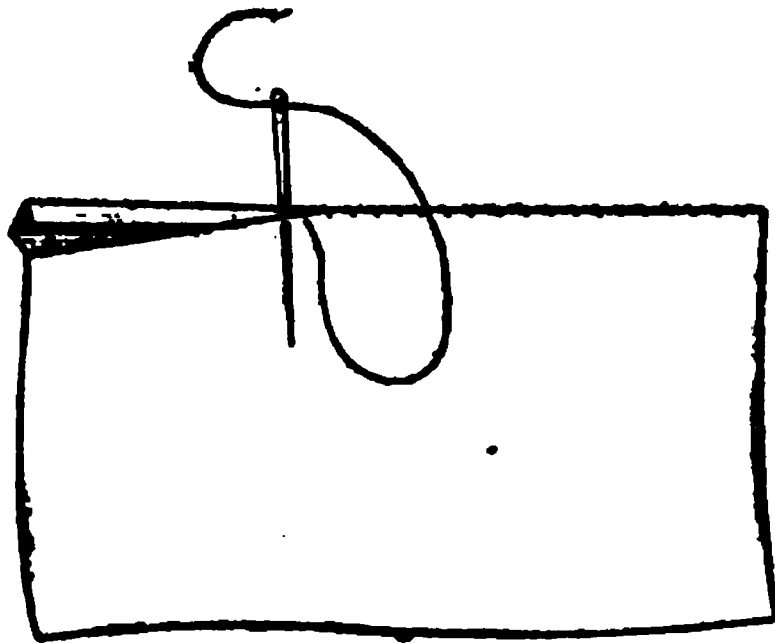


FIG. 13.—Overhanding stitch (French hem).

1. Turn $\frac{1}{4}$ -inch hem to right side and baste.
2. Fold hem back to wrong side, crease.
3. Overhand lace to double folded edge.

B. Edge rolled and whipped (demonstrate).

1. Lace overhanded to this finish.

C. Edge scalloped (demonstrate).

D. Binding or braid (demonstrate).

1. Used most often where upper edge is gathered.
2. Place two rows of gathers width of braid or binding apart.
3. Stitch one edge of braid or binding to upper row of gathers. Wrong side of braid to wrong side of garment and braid extending above garment.
4. Crease braid to right side along stitching.
5. Baste lower edge of braid to second row of gathers and stitch.
6. Lace or tatting may be overhanded to this or it may be decorated with feather, chain, or other ornamental stitching.

E. Embroidery facing (demonstrate).

1. Trim plain material away from embroidery leaving about $\frac{1}{4}$ -inch or $\frac{1}{2}$ -inch; narrower for armholes.
2. Place right side of embroidery to right side of material with raw edge of embroidery extending $\frac{1}{4}$ -inch beyond first row of gathers on garment.
3. Baste and stitch.
4. Turn in raw edge of embroidery $\frac{1}{4}$ -inch, turn down over the raw edge of the material and baste.
5. Stitch to place.
6. All joinings in lace or embroidery should come at the underarm seams in the armhole or center front in the neck.

F. Eyelets (demonstrate).

1. Eyelets may be used in place of beading if desired.

*Lesson V.***I. Continuation of neck and armhole finishes.****UNIT 2.—UNDERSKIRT.***Lesson I: Introductory Lecture, Discussion, and Demonstration.***I. Use of garment.****II. Types.****A. Plain for general wear.**

1. Hem at lower edge.
2. Simple band trimming.
3. Scallops—embroidery or self trimming.
4. 2, 4, or 5 piece skirt.

B. Occasional wear.

1. Dust ruffle and flounce.
2. Cut skirt—flounce on lower edge.

III. Materials (suitable prices and widths).**A. Muslin, cambric, nainsook, percale, poplin, sateen, seersucker, wash satin or silk.****B. Trimmings.****1. Embroidery and lace flouncings.**

- a. Types.
- b. Design.

} See Section I, Unit 1, Lesson I.

C. Compare desirability of one of the materials with the others.**IV. Design for skirt. (See Bibliography).****A. Simple in line.****B. Simple in decoration.****C. Study designs—try to discover number of seams, etc., location of seam lines in relation to figure, space relations, balance, etc.****D. Suitability of design to use of skirt.****V. Patterns.****A. Suitable to carry out design.****B. Measurements for.**

1. Waist measure taken snugly at normal waist line.
2. Hip measure taken at fullest part of hips, easy measure.
The place for taking this is lower on stout figures than on slender, or about 7 inches below waist.

C. Purchase of.**VI. Computation and purchase.****A. Quantity of material.****B. Quantity of trimming.****C. Findings.****D. Cost of above.****VII. Comparison with ready-made garments.****A. Advantages.****1. Durability; cut; workmanship.****B. Disadvantages.****1. Time spent in making, etc.****VIII. Sewing machine (demonstration).****A. Purpose. (See Bibliography.)**

1. To teach intelligent care and use of sewing machine.
 - a. Names of parts and their functions.
 - b. Cleaning and oiling.
 - c. General care.

*Lesson II: Demonstration and Classroom Practice***I. Machine practice.****A. Treading.**

1. Thread removed from eye of needle.
2. Both feet flat on treadle.
3. Turn balance wheel to start. Practice until ability to tread easily and evenly has been acquired.

B. Preparatory practice for stitching.

1. Practice on paper without thread until ability to stitch in straight line has been acquired. Emphasize.

C. Threading.

1. Needle.
2. Bobbin.

D. Stitching.

1. With cloth and thread, practice stitching and methods of beginning and ending line of stitching to make secure.
2. Emphasis on good tension, stitch and thread suitable for material.

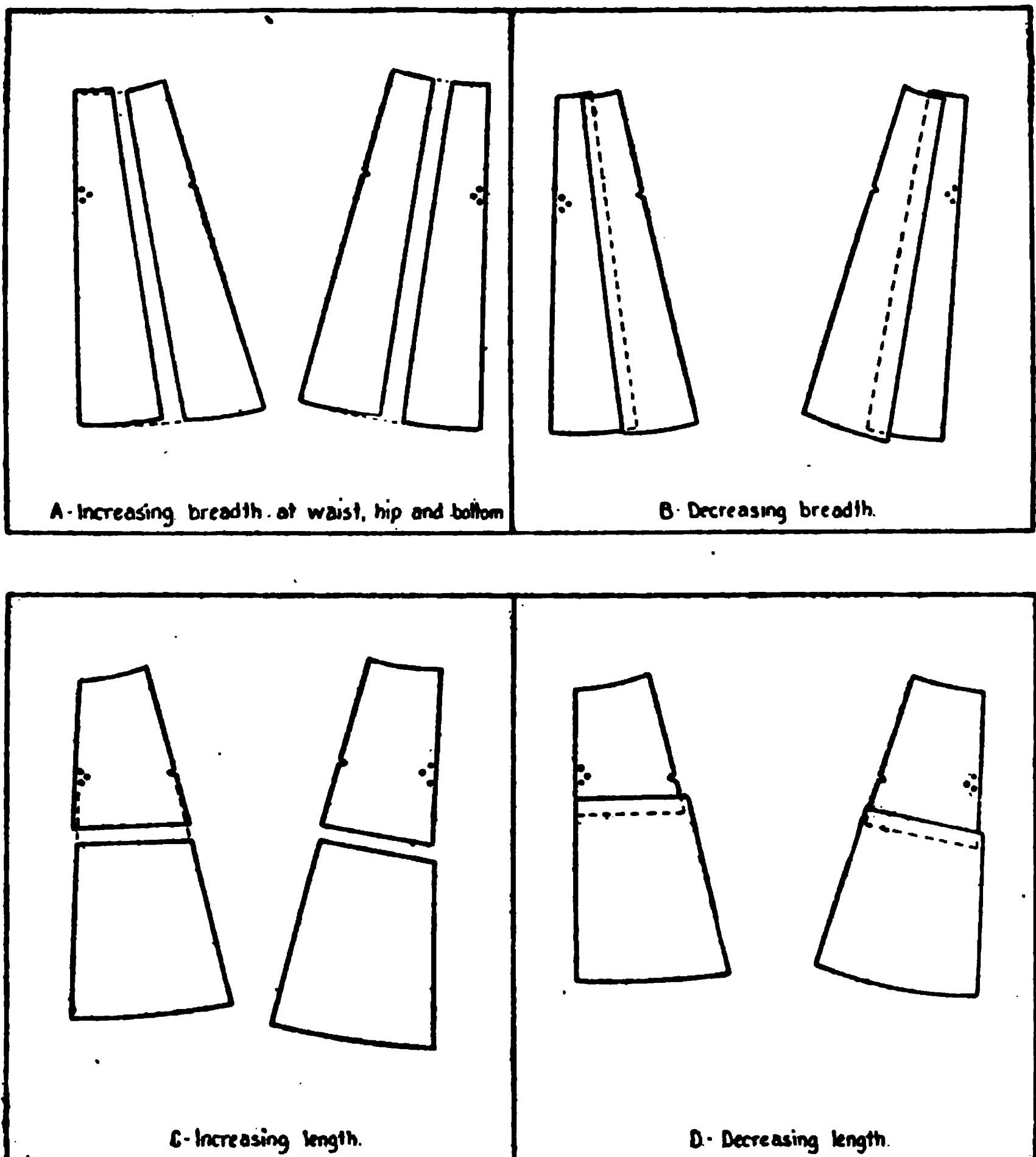


FIG. 14.—Alteration of skirt pattern.

I. Machine practice—Continued.**E. Use of attachments.**

1. The use of these should be demonstrated as the need for them arises during the remainder of the course.

II. Testing and altering pattern.

- A. Measure parts of pattern and compare with individual measurements taken. If pattern is too large around, fold a tuck lengthwise through each gore, taking same amount from each, if the seams fall in good direction.

Too long—shorten by tuck in each gore.

Too short—cut through gores and separate.

Too tight—slash pieces through center and separate (fig. 14.)

III. Preparation of material, cutting, and marking.

- A. See directions in Section I, Unit 1.

IV. Basting garment (fig. 3).

- A. Pin parts together according to notches (pins at right angles to seams).
- B. Baste with small stitches, leaving 12 inches from the waist line for the opening at one of the seams.

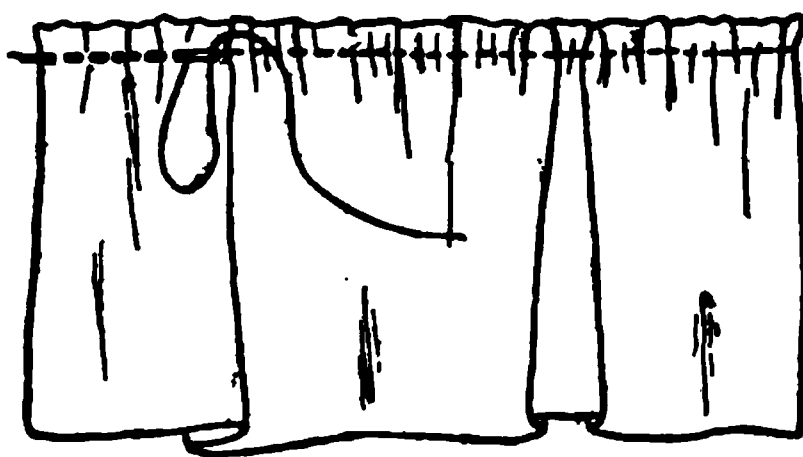
V. Planning flounce—gathering (fig. 15). Demonstrated.

FIG. 15—Gathering.

- A. Plan the making of the flounce so that a great deal of the sewing can be done at home.

1. Gathered flounce.

- a. Tucked.

- b. Lace trimmed.

- c. Embroidered flouncing.

2. Circular flounce.

Lesson III.

I. Fitting.

- A. Pin skirt to figure at waist line.
- B. Examine skirt. Notice lines of seams, whether too full or too tight. Repin.
- C. Make alterations, remove pins, trace other side to correspond. Rebaste, try on again.
- D. Mark line for length at bottom of skirt, remove skirt.

II. Stitching seams.

- A. Plain—overcasted (fig. 18). Demonstrate.
- B. French.
- C. Discuss two kinds of seams as to advantages, etc.

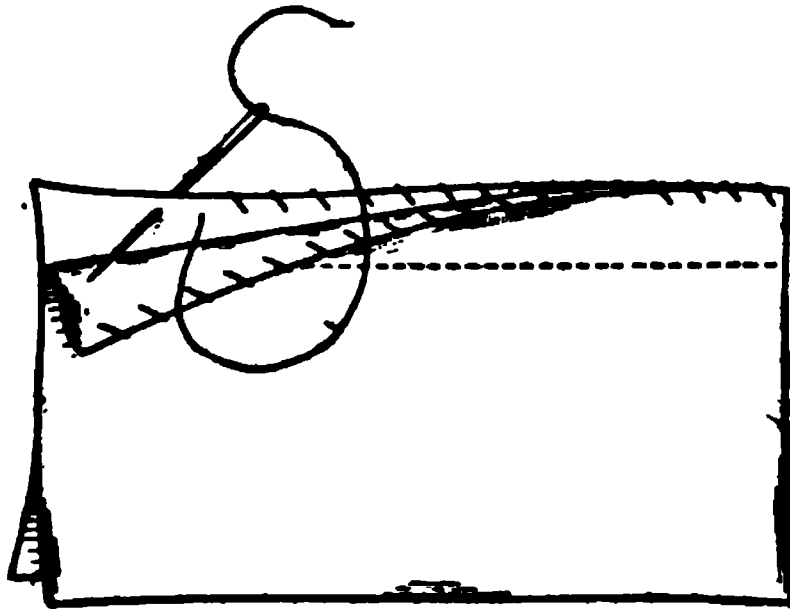


FIG. 16.—Plain seam, overcasting.

*Lesson IV.***I. Placket facing.****A. Bound (continuous). Demonstrate. (See Bibliography.)**

1. Cut strip of material twice length of placket, and twice width desired for facing plus $\frac{1}{2}$ inch for seams.
2. Lay right side of facing to right side of garment with raw edges even.
3. Baste to within $\frac{1}{2}$ inch of bottom of opening.
4. Stitch by hand around base of opening and beyond for $\frac{1}{2}$ inch. Ease garment on facing.
5. Continue basting as before, reaching end of opening; stitch.
6. On under side of placket, crease facing the width desired and fold back on itself. Bring raw edges of seam forward on facing, turn in raw edge of facing and baste to line of first stitching; stitch.
7. Let under side of placket facing form extension.
8. Fold facing on upper side back to wrong side of garment before attaching skirt to belt.

B. Bound and faced (continuous). Demonstrate.

1. Proceed as for placket in A as far as first stitching.
2. Follow direction No. 6 under A for under side of placket. Baste to within $\frac{1}{2}$ inch of base of opening.
3. Clip straight through facing at this point to center crease.
4. Cut away material on under facing $\frac{1}{2}$ inch from line of center crease.
5. Turn in raw edge on line of crease and baste to wrong side of garment.
6. Stitch.
7. Double placket to place and make a diagonal stitching across the base to give added strength.

II. Belt.

- A. Lengthwise strip of cloth, twice desired depth plus seams, by required length plus 3 inches (1 inch to turn at each end and 1 inch for extension).
- B. Fold 1 inch in at each end (mark off 1 inch for extension), find center between this point and other end.
- C. Place center front of skirt to center of belt with wrong side of the skirt to the right side of the belt.
- D. Baste and stitch. Turn upper side of belt over on this; stitch.
- E. Button and buttonhole or hook and eye.

Lesson V.

- I. Hem.
 - A. Plain hem. (*See Section I, Unit 1.*)
 - B. Receiving tuck and dust ruffle (demonstrate).
- II. Flounce (demonstrate).
 - A. Tucking.
 - B. Sewing on lace.
 - C. Gathering.
 - D. Types of trimming.
 - 1. Embroidery ruffle.
 - 2. Self trimmed.
 - a. Bias folds—double.
 - b. Shaped bands—double.

UNIT 3.—BUNGALOW APRON.

Lesson I: Introductory Lecture, Discussion, and Demonstration.

- I. Use of the garment to be made.
 - II. Types.
 - A. Kimono.
 - B. With set in sleeve.
 - C. Back or front closing.
 - III. Suitable materials (price and width).
 - A. Gingham.
 - B. Chambray.
 - C. Percale.
 - D. Lawn (not as desirable as above because weaker, thinner, and not as much body).
 - IV. Patterns.
 - A. Measurements for.
 - 1. Bust measure.
 - B. Purchase of.
 - V. Computation.
 - A. Quantity of material.
 - B. Findings, thread, and buttons.
 - C. Cost of above.
 - VI. Comparison with ready-made garments.
 - A. Advantages and disadvantages of each.
- (*See Section II, Unit 2, Lesson I, Part VII.*)

Lesson II: Demonstration and Classroom Practice (Speed emphasized).

- I. Cutting apron.
 - A. Preparation of material
 - B. Interpreting pattern.
 - C. Altering pattern.
 - 1. Measure pattern, compare with measures taken.
 - a. If too long, fold tuck across parts; if too short, slash pattern and separate parts to give required measure.
 - D. Placing pattern on material.
 - 1. Study directions on pattern; follow carefully, simply laying pieces on without pinning; try other placing to see if more economy can be practiced.
 - 2. Pin pattern to place.
 - 3. Cut out around pattern (if no seams are allowed on pattern, allowance must be made for this).
 - 4. Trace seams, place for pocket, etc.
 - 5. Pin or baste for stitching.

II. Fitting.

- A. If apron is of the kimono type, do not fit too closely under the arm to prevent freedom of motion.

*Lesson III.***I. Seams.****A. Suitable kinds.**

- 1. French (fig. 4).
- 2. Stitched fell; finished on right side (fig. 6).

II. Facing neck and sleeves (demonstrate).

- A. Inside and outside finish.
- B. Placing facing.
- C. Stitching.

*Lesson IV.***I. Hem (figs. 10 and 11).**

- A. Proportionate depths of hems; best depth to use on apron.
- B. Method of measuring and laying hem (emphasis on amount turned in at top and evenly trimmed).
- C. Baste (if necessary) and stitch (emphasis on fastening threads).

II. Pocket (demonstrate).

- A. Type.
 - 1. Patch.

III. Belt.**UNIT 4.—CARE AND REPAIR OF CLOTHING.***Lesson 1: Lecture, Demonstration, Discussion, and Classroom Practice.***I. General care of clothing. (See Bibliography.)****A. Reasons for.**

- 1. Cleanliness.
- 2. Comfort.
- 3. Appearance.
- 4. Conservation. (See Bibliography.)

B. Proper airing of all clothing in daily use.**C. Care of coats, suits, dresses, etc.**

- 1. Brushing.
- 2. Removing spots. (See Bibliography.)
- 3. Mending rips or tears.
- 4. Replacing buttons, hooks, eyes, etc.
- 5. Use of removable linings.
- 6. Pressing.

D. Arrangement of clothing in closets, drawers, chests, etc., when not in use.**E. Methods of folding, hanging, covering, and storing between seasons; protection from moths, etc.****F. Commercial cleansing and cleansing establishments.****G. Care of shoes.**

- 1. Cleaning.
 - a. Brushing.
 - b. Polishing of leather.
 - c. Cleaning of white canvas, suede, buckskin.
- 2. Importance of having an extra pair of shoes for change.
- 3. Overshoes.
 - a. As a protection to shoes.
 - b. Kinds.
- 4. Correct method of walking to preserve shoes.
- 5. Repairs.
 - a. Importance of.

II. Repair of underclothing. (See Bibliography.)

NOTE.—Underwear, knitted and woven, properly laundered and in need of mending, should be provided before this lesson.

A. Consideration of garment with idea of mending.

1. Present value of garment and value of time required for mending.

B. Darning of knitted articles.

1. Stocking darning (fig. 17).

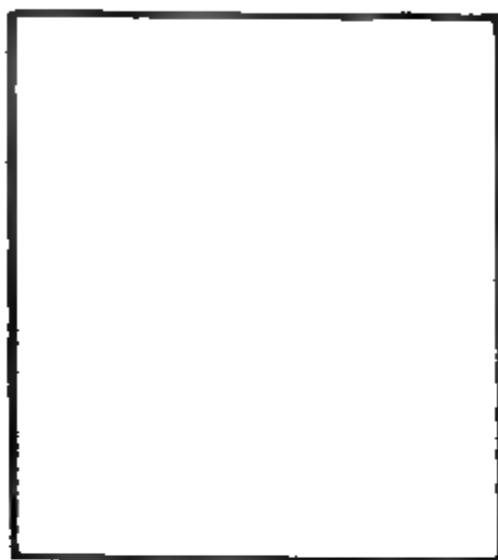


FIG. 17.—Plain darn (stocking).

a. Holes.

b. Runs.

C. Stockinette darn.

1. Same process as above. Used in knitted undergarments, sweaters, mittens, etc.

D. Patching.

1. Hemmed patch (fig. 18).

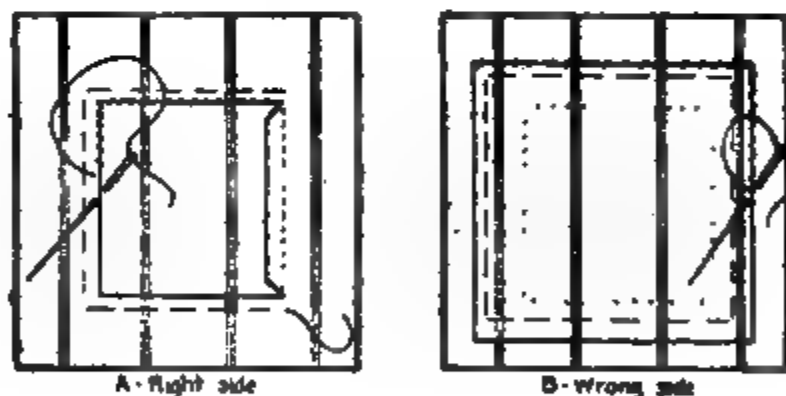


FIG. 18.—Hemmed patch.

- a. Suitable for underwear, aprons, boys' shirts, housefurnishings.

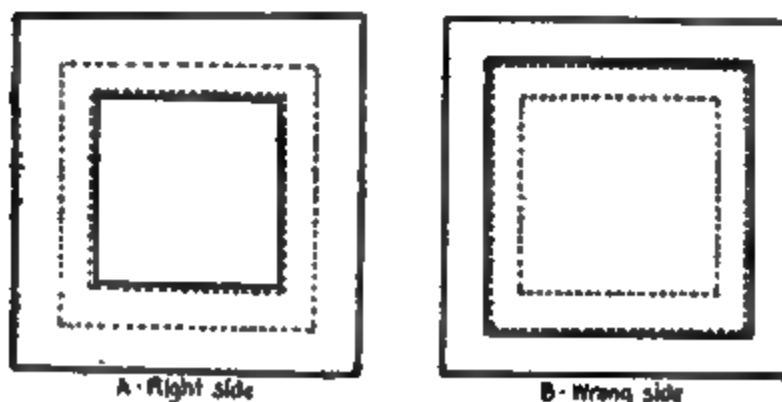


FIG. 19.—Stitched patch.

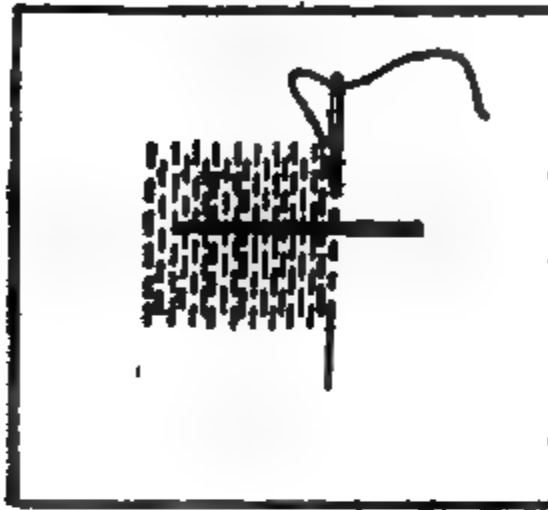
II. Repair of underclothing—Continued.

D. Patching—Continued.

2. Stitched patch (fig. 19).

a. Suitable for heavy cotton and woolen garments as—

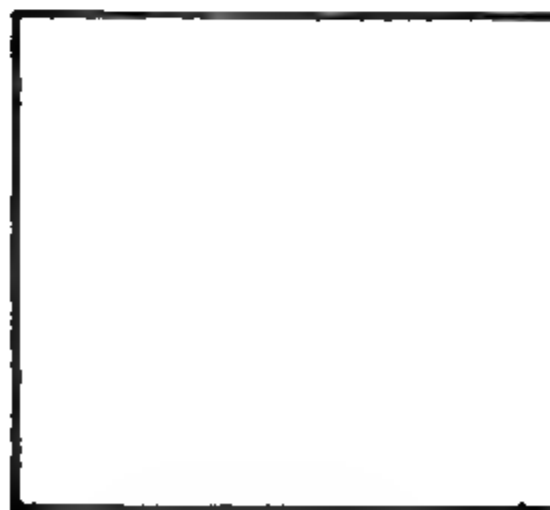
1. Men's overalls.
2. Men's jumpers.
3. Men's coats.

Lesson II.

A—Straight darn



B—Three-cornered darn



C—Diagonal darn

FIG. 20.—Darns in woven materials when torn.

I. Repair of outer garments and fine linen.

NOTE.—Outer garments in need of repair and worn table linen should be provided before the lesson.

A. Consideration of location and nature of the damage, as to—

1. Strain upon it.
2. How prominent.
3. Best method to use in repair.
4. Materials to use.

B. Darns in woven materials (fig. 20).

1. Warp or woof tear.
2. Diagonal tear.

C. Patching.

1. Overhanded patch (fig. 21).

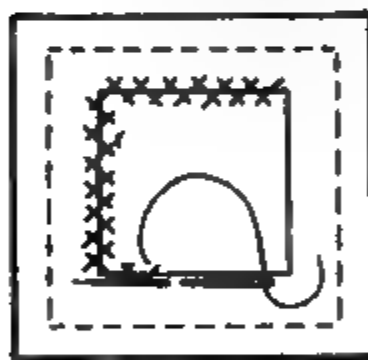


A - Right side.

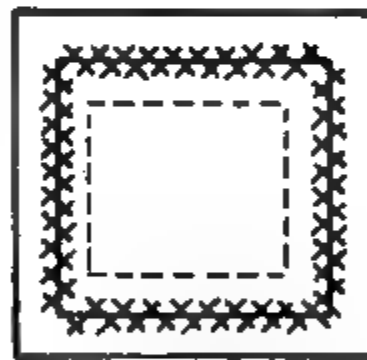
FIG. 21.—Overhanded patch.

- a. Used in outer garments where it is desired to have patch show as little as possible.

2. Flannel patch (fig. 22).



A - Right side



B - Wrong side.

FIG. 22.—Flannel patch.

- a. Used in baby flannels, blankets, etc.

3. Darned patch (fig. 23).

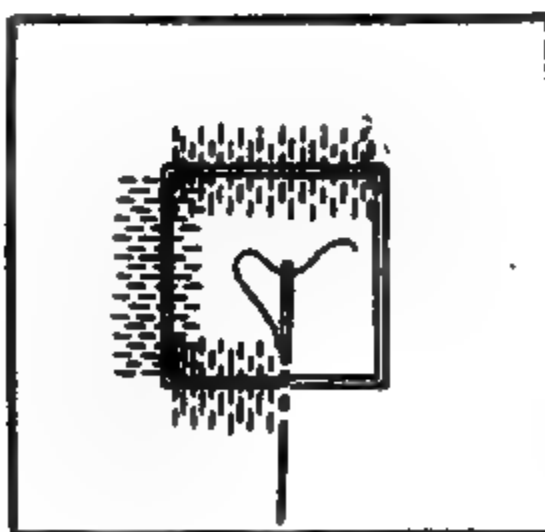


FIG. 23.—Darned patch.

- a. Used in fine table linen.

Section II.—Elementary Dressmaking.

The purpose of this section is:

- I. To teach women to become wiser spenders of incomes; to conduct their home making on as economic a basis as men conduct their business enterprises.
 - A. Means to the end—*Household* budgets.
 1. Shelter.
 2. Food.
 3. Clothing.
 4. Operating expenses.
 5. Education, recreation, travel, philanthropy.
 6. Savings.
 - B. Methods of making budgets.
 1. Income lists.
 2. Disbursement lists.
 3. Allotments.
 4. Summary.
 - C. Vital interest to class—*Clothing* budget.
 1. Methods of planning.
- II. To teach processes involved in the construction and decoration of simple washable waists and dresses.
 - A. Use of patterns.
 - B. Processes of cutting, basting, fitting, altering garments.
 - C. Process of making and finishing garments.
- III. To aid in the campaign for conservation by teaching economy.
 - A. In purchasing:
 1. Judgment of materials.
 - Strength and durability.
 - Suitability to need of wearer.
 - B. In time and labor.
 - C. Through care and repair of clothing.
 1. Knowledge of proper care of garments.
 2. Knowledge of repair processes.
 3. Knowledge of cleansing processes—methods for different fabrics.
 - D. Through renovation of material.
 1. Importance of conserving.
 2. Use of old materials instead of buying new.
 3. Methods of renovating cotton, linen, and similar fibers.
 - E. Through remodeling garments.
 1. Economic use of old materials in making undergarments, outer garments, and articles for household use.
 2. Judgment in estimating quantities of material, with relation to selection of pattern, and purchase of new material for combination; computation of costs.
 3. Creation of an appreciation for simple, attractive designs, combination of color, texture, etc.
 4. Application of technical processes already learned to renovation of garments.

UNIT I.—BUDGETS.*Lesson I: Introductory Lecture, Discussion, and Demonstration.*

- I. Meaning of budgets.
 - A. Plans for spending incomes.

II. Reason for making budgets.

A. To apportion income so as to provide for all needs, cultural wants, and aid in all forms of conservation and thrift.

1. Shelter.
2. Food.
3. Clothing.
4. Operating expenses.
5. Education, recreation, travel, philanthropy, etc.
6. Savings.

III. How to make a budget.

- A. List of all **sources of incomes**.
- B. List of all necessary disbursements.
- C. Allot percentage of income to each of **above**.
- D. Review allotment; readjust to meet all **requirements**.

IV. Clothing budget.

A. Allotment of allowance for clothing.

1. Outer clothing 70 per cent of allotment.
 - a. Suits.
 - b. Coats.
 - c. **Dresses**.
 - d. Sweaters.
 - e. Waists.
 - f. **Shoes**.
 - g. Rubbers.
 - h. **Hats**.
 - i. Gloves.
2. Underclothing 20 per cent.
 - a. Knitted (**vests, drawers, or union suits**).
 - b. Hosiery.
 - c. Drawers.
 - d. Chemises.
 - e. **Petticoats**.
 - f. **Nightdresses**.
 - g. **Corsets**.
 - h. Kimonos.
3. Accessories 5 per cent.
 - a. Neckwear.
 - b. Belts.
 - c. Veils.
 - d. Umbrella.
 - e. Handbag.
 - f. **Handkerchiefs**.
4. Sundries 5 per cent.
 - a. Dress shields.
 - b. Hairpins.
 - c. Pins.
 - d. Combs—
 - (1) Dressing.
 - (2) Fancy.
 - e. Brushes—
 - (1) **Hair**.
 - (2) Hand.
 - (3) Tooth.

IV. Clothing budget—Continued.

A. Allotment of allowance for clothing—Continued.

4. Sundries 5 per cent—Continued.

f. Toilet preparations.

(1) Soap.

(2) Tooth powder.

(3) Talcum powder.

g. Repairs.

h. Cleansing.

B. Making budget.

1. List all clothing, accessories, and sundries left from previous year, which are usable.

2. List all clothing, accessories, and sundries to be provided for this year.

3. Apportion allotment for each group.

4. Check allotment for each article according to the general current prices for the same.

5. Review entire allotment to ascertain where and how conservation may be practiced.

a. Making instead of buying.

b. Freshening old without much expense.

(1) Cleansing.

(2) Fresh collars and cuffs.

c. Remodeling.

d. Doing without *unnecessaries*.

Classroom practice.

I. Practice in planning budgets, working on suggested basis. (See Bibliography.)

A. Individual clothing budgets.

B. Family clothing budgets.

Home work.

I. Complete work not finished in class, also make individual clothing budget for self to be brought in next lesson.

UNIT 2.—WASHABLE WAISTS.

(See Bibliography.)

Lesson I: Introductory Lecture, Discussion, and Demonstration.

I. Use of garment.

A. For wear with separate skirts of woolen or washable materials.

II. Types.

A. Tailored shirt waist for business or sport wear, with or without yoke.

1. Materials suitable.

a. Linen, percale, Indian head, pongee, silk, madras, poplin, muslin, habutai, etc.

B. Lingerie blouse. (See Section II, Unit 3, for method of making.)

1. Materials.

a. Batiste, lawn, voile, marquisette, swiss, dimity, organdie, handkerchief linen.

C. Silk blouse.

1. Materials.

a. Crêpe de chine, crêpe georgette, washable taffeta, washable satin.

III. Materials.

- A. Relative durability.
- B. Relative cost.
- C. Suitability to wearer.
- D. Suitability to design.
- E. Suitability to occasion.

IV. Decoration. (*See Bibliography.*)

A. Types.

1. Self trimmings (*demonstrate*).

- a. Tucks.
- b. Plaits.
- c. Piping.
- d. Cording.
- e. Binding.

2. Needlework.

- a. Embroidery.
- b. Hemstitching (*demonstrate*).

3. Insertions and edgings. (*See Section I, Unit 1, Lesson I.*)

- a. Lace.
- b. Embroidery.

4. Buttons.

- a. Pearl.
- b. Linen.
- c. Crochet.

B. Suitability and effectiveness.

C. Durability.

D. Cost in money or time.

V. Choice of design.

- A. Suitability to occasion.
- B. Suitability to type of the wearer.
- C. Simplicity and beauty of line and decoration.
- D. Selection of pattern from prevailing fashions to meet demands of good design.
- E. Measurement for pattern.
- F. Purchase of pattern.

VI. Computations.

- A. Amount of material.
- B. Quantity of trimming.
- C. Findings.
- D. Cost of above.
- E. Comparison with amount allowed in budget.

VII. Home-made *v.* ready-made waists considered from the standpoint of—

- A. Good design—simplicity and individuality.
- B. Durability of material.
- C. Quality of material and workmanship.
- D. General fit and appearance when worn.
- E. Time consumed in making *v.* altering.
- F. Appearance after laundering.
- G. Actual cost.

VIII. Purchase of material, etc.

IX. Shrinking, and preparing material for cutting. (*See Sec. I, Unit 1, Lesson II.*)X. Equipment to be provided. (*See Introduction, p. 10.*)

*Lesson II: Demonstration and Classroom Practice.***I. Testing and altering pattern.****A. Measurements necessary for testing.****1. Bust measure.**

Easy measurement around fullest part of bust.

2. Length of front.

Taken from hollow at base of neck to waist line.

3. Length of back.

Taken from prominent bone at base of neck to waist line.

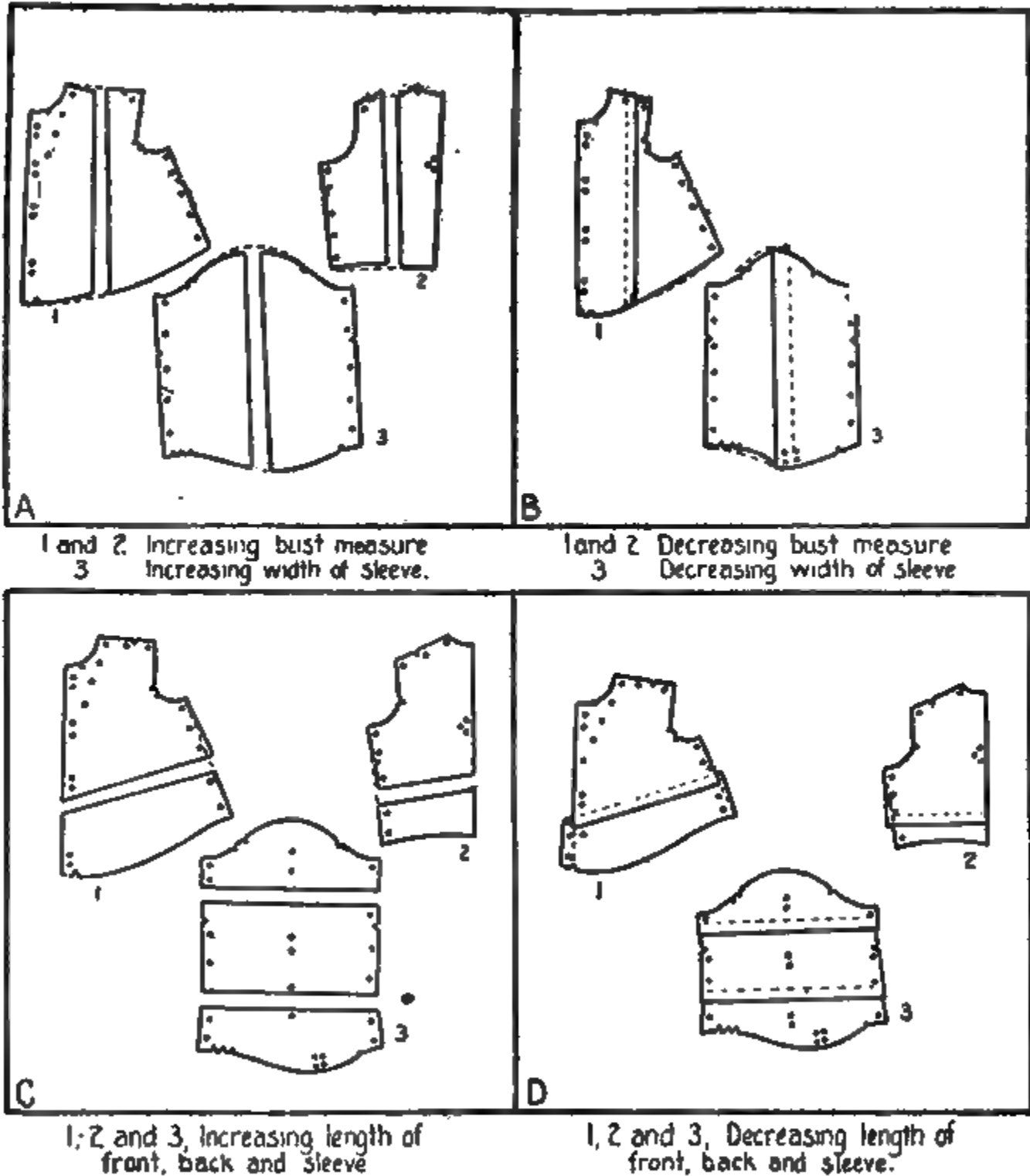
B. Method of making alterations (fig. 24).

FIG. 24.—Alteration of waist pattern.

1. Measure pattern to see what variations occur in the two sets of measurements.
2. If too full fold tuck straight down through waist from center of shoulder seam, front and back. Each tuck removes one-fourth the entire amount of fullness.

I. Testing and altering pattern—Continued.

B. Method of making alterations—Continued.

3. If too scant, slash in same place and separate.
4. If too long, fold tuck across about 2 inches above waist line, front and back.
5. If too short, slash and separate at above point.

II. Preparation of material.

A. Place all plaits, tucks, embroidery, lace, etc., unless allowance for such is marked in pattern.

1. Close shoulder seams where it is necessary to carry the trimming over the shoulder.
2. Plan tucks, plaits, and stripes in material to match in shoulder seams.
3. Plan for opening.

III. Placing pattern and cutting. (See Sec. I, Unit 1, Lesson II.)

A. Read and follow carefully all directions accompanying pattern.

B. Study most economical placing of pattern.

IV. Marking.

A. Trace all seam lines. Mark notches and center front, center back and waist lines with colored thread. Do not use a tracing wheel on silk, as it is liable to cut unless used very lightly. Mark with tailor tacking instead.

1. Tailor basting or tacking.

- a. Thread needle with double thread.
- b. Take long basting stitches through both thicknesses of cloth along line to be marked.
- c. Leave loop of thread between each stitch.
- d. Pull material apart as far as looseness of stitches will permit and clip threads midway between the two pieces.
- e. Mark with colored thread along line of these tacks.

V. Basting.

A. Baste seams of waist as indicated in pattern with notches matching.

B. Placket facing for sleeve (demonstrate).

NOTE.—Follow directions in pattern if given, or see bibliography for good ones.

1. Made as bound and faced placket facing in section 1, unit 2, Lesson IV, with extension left on upper part of sleeve and covered with extra piece, either pointed or square, at the ends, which is turned in $\frac{1}{2}$ inch all around and stitched close to the edge covering extension and seam.
2. In waist where this finish is not desired a very narrow continuous bound placket may be made.

C. Baste seams of sleeves and gather with two rows of gathering threads where indicated.

Lesson III.

I. Fitting.

- A. Place waist on figure. Pin center fronts together.
- B. Tie a tape around the waist and adjust the fullness.
- C. Alter at seams until waist sets easily and smoothly on the figure. Fit only right-hand side.
- D. Try sleeves to see if correct size; pin to armhole.

II. Alterations. (See Section 1, Unit 1, Lesson II.)

III. Second fitting.

- A. Sleeve should be basted to place for this, matching notches; cut cuffs and collar from cheap material for testing.
- B. Notice that corrections have been made.
- C. Sleeves.
 - 1. Notice length of sleeve, length and width of cuff.
 - 2. Note particularly that grain of material in the sleeve should fall straight from the top of the shoulder to the elbow.
- D. Notice whether collar has a becoming line and mark depth for opening of waist.

IV. Seams.

NOTE.—From this point on the method of finishing described will be that used on the tailored waist. The method of finishing waists of the lingerie type will be found under section 2, unit 3.

A. Stitched fell (fig. 6). (See section 1, unit 1, Lesson II.)

- 1. $\frac{3}{4}$ -inch seams finished; turn to the front.
- 2. Stitch sleeve in armhole before closing underarm seam if notches indicate this placing.
- 3. Turn upper part of sleeve to under part, except where underarm and sleeve seam are in one; then turn underarm seam to front.

NOTE.—If tucks and plaits were not stitched before cutting, this must be done before any seam finishes are attempted.

Lesson IV: Tailored Waist.

I. Openings.

A. Box plait.

- 1. Turn and stitch box plait on right-hand side of front.
- 2. Turn hem in left-hand side $\frac{1}{4}$ inch narrower than box plait.
- 3. Work buttonholes (barred at both ends) vertically in box plait (fig. 12).

B. Coat opening.

- 1. Both sides hemmed, or with some types of collars an extra piece attached to collar forms a facing.
Do not stitch hem; let buttons and buttonholes keep it in place; it may be stitched on outer edge in continuous line with the collar.
- 2. The raw edge of the facing may be overcast or turned once and stitched.
- 3. Buttonholes are worked horizontally in a coat opening.
- 4. Bound buttonholes are effective.

a. Bound buttonholes (fig. 25). Demonstrate.

- (1) Baste piece of cotton material to wrong side of waist where buttonholes are to be cut, the entire length of the opening, to form a stay.
- (2) Mark buttonholes with colored thread.
- (3) Cut straight strip $1\frac{1}{2}$ inches wide for binding buttonholes. Cut into lengths 1 inch longer than buttonholes.
- (4) Baste these to waist along lines marked for buttonholes, right sides together.
- (5) Stitch around buttonhole $\frac{1}{8}$ to $\frac{1}{4}$ inch away from the colored thread.
- (6) Cut on colored thread and clip from ends of slash to each corner of stitched rectangle.
- (7) Fold cut edges back.

CLOTHING FOR THE FAMILY.

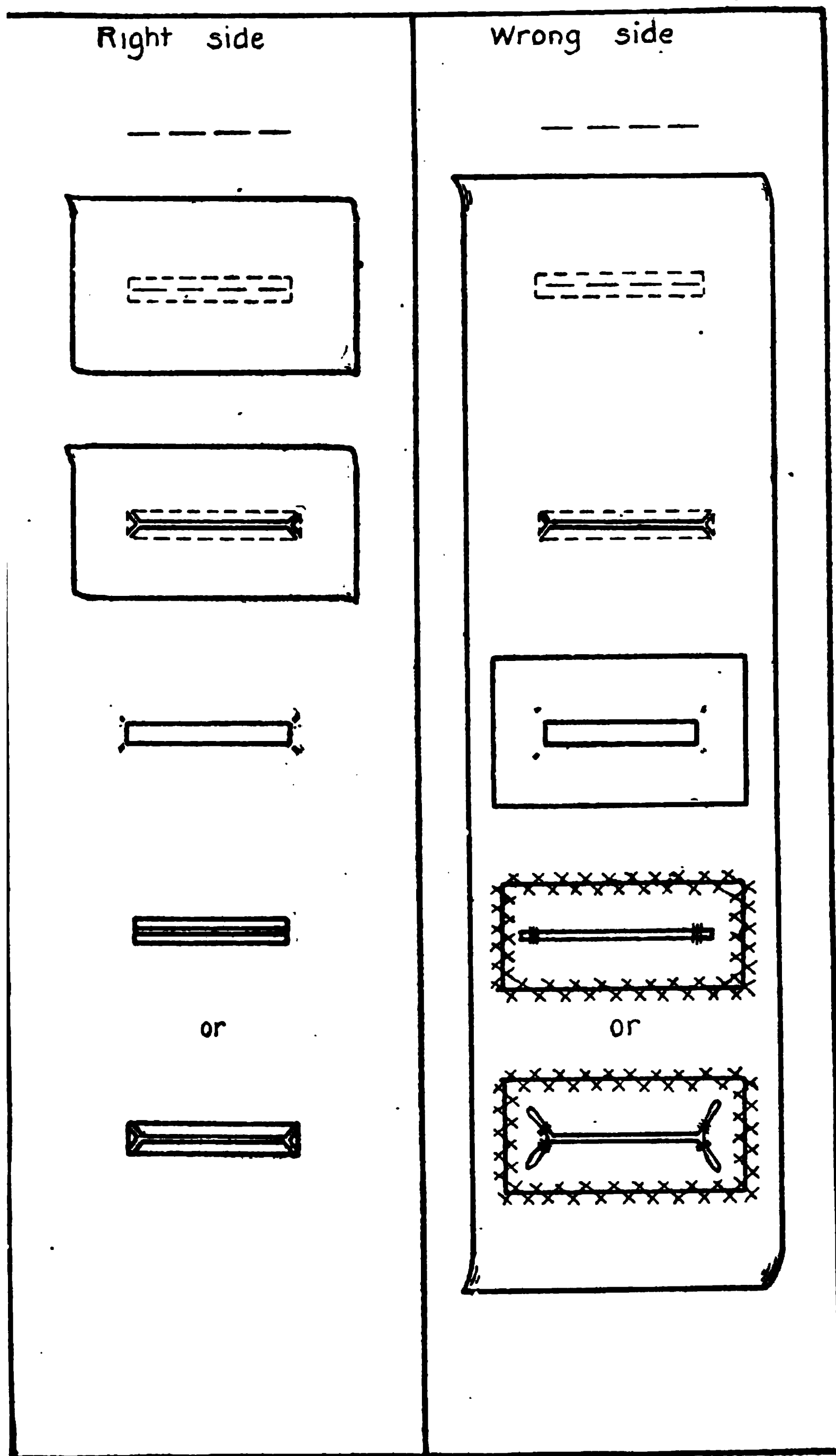


FIG. 25.—Bound buttonholes.

I. Openings—Continued.**B. Coat opening—Continued.****4. Bound buttonholes are effective—Continued.****a. Bound buttonholes—Continued.**

(8) Draw binding through opening to wrong side.

(9) Fold binding to form pipings which meet down center of opening.

(10) Fold out fullness in corners in tiny inverted box plaits.

(11) Baste and catch stitch edges to cotton stay. Press.

(12) Baste front facing or under side of hem to place.

(13) Cut buttonholes through this to correspond to those in the waist. Cut $\frac{1}{8}$ to $\frac{1}{4}$ inch longer than opening of buttonholes and clip at corners as before.

(14) Turn under raw edge and hem to binding.

(15) Press.

II. Collar.**A. Single. Demonstrate.**

1. Faced or bound edge.

2. Sewed to waist, wrong side of collar to right side of waist. Face with narrow bias strip of material.

B. Double.

1. Shaped.

a. Stitched through both thicknesses to neck line which has been cut to proper shape and faced as in case of collar of single thickness.

b. The under side of the collar, only, may be stitched to the waist and the upper side turned in and hemmed to this line of stitching. (Demonstrate.)

2. Straight.

a. This is set on at the regulation neck line in the manner described in 1-b. This collar may be allowed to roll back or may be folded back on itself and buttoned close under the chin.

*Lesson V.***I. Finish at bottom.**

A. Hem at waist line wide enough to form casing for elastic. Fastened with hook and eye.

B. Back gathered at waist line as far as underarm seams, and gathers adjusted to place. Stitch either tape, braid, or narrow belt of material over gathers to hold them in place. Narrow hem on lower edge.

C. Left plain to be belted in with one of the patent waist holders.

1. The lower edge may be finished with a narrow hem or simply overcasted.

II. Cuffs.

A. Straight cuff of double material—to be stiffened or not as desired.

1. Stitch ends and one edge, or only ends if material is folded, turning back edge to be attached to sleeve, $\frac{1}{4}$ inch before stitching.

2. Set to sleeve as indicated by notches, slip gathers between edges of cuff, and stitch with double row of stitching.

a. If cuff is to be worn with links turn facing on under part of sleeve back to wrong side of sleeve placket before attaching cuff; if cuff is to lap and button let facing form extension.

II. Cuffs—Continued.

B. Turn back cuff.

1. Finished as above.

C. Buttons and buttonholes (figs. 12 and 25).

1. Place buttonholes in placket and cuff.

UNIT 3.—WASHABLE DRESSES.

(See Bibliography.)

NOTE.—If desired, the lessons on the making and use of a dress form (section 3, unit 2) may be used in connection with this unit.

Lesson I: Introductory Lecture, Discussion, and Demonstration.

I. Use of garment.

A. House dress.

B. Business dress.

C. Afternoon dress.

II. Materials.

A. Kinds suitable.

1. Business and house dress—Linen, gingham, pique, chambray, percale.

(Avoid extremes in color or design of fabric.)

2. Afternoon dress—Organdie, batiste, swiss, dimity, voile, lawn, cotton crepe, handkerchief linen.

(Teacher should have samples of different kinds and grades which have been tested for fading.)

B. Methods of testing.

1. Test for strength.

a. Effect of pulling.

b. Effect of rubbing.

2. Test for fastness of color.

C. Study of manufacture of cotton and linen dress fabrics, especially methods of placing design on materials.

1. Printed design.

2. Woven design.

a. Special care in dotted swiss that dots are so woven that they do not easily pick out.

3. Effect of design with decided up or down, left or right, or of very large pattern upon the economical cutting of a garment. (See Bibliography.)

III. Trimmings.

A. Embroidery, lace, handwork, and self trimmings discussed under units on chemise and washable waists.

B. Ribbons.

1. Taffeta, satin, moire, velvet, etc.

a. Proper widths for various uses and suggested ways of using.

(1) Sashes.

(2) Ties.

(3) Interlacings.

b. Proper combinations of types of ribbons and materials.

C. Silk.

1. Proper and improper ways of combining silk with cotton materials.

a. Easily removed when cotton needs freshening.

b. Collars, cuffs, girdles, folds.

III. Trimmings—Continued.

D. Hems.

1. Reversed.

a. Turned to right side of skirt.

b. Usually finished at top with cord or piping.

2. Shaped.

a. Shaped as desired and faced.

E. Smocking, puffings, folds, gauging, and slip stitching. (Demonstrate; see Bibliography.)

F. Buttons.

1. Kinds.

a. Pearl.

b. Linen.

c. Crochet.

d. Of material like dress.

e. Glass, china, metal, etc.

2. Proper use and combination.

IV. Design.

A. Appropriateness to occasion.

B. Adaptability to weave and design of material.

C. Suitability to age, complexion, and figure of wearer.

D. Simplicity.

E. Choice of pattern that will carry out design.

V. Findings.

A. Net for protective inner lining, if desired.

B. Belting.

C. Snaps and hooks and eyes.

D. Thread.

E. Cord (if cording is done).

F. Pattern.

VI. Computations.

A. Amount of material for dress.

B. Amount of material for lining.

C. Amount of contrasting material, or ribbon trimmings.

D. Number of buttons.

E. Cost of entire purchase.

F. Comparison with ready-made dresses.

G. Comparison with amount allowed for wash dress in budget.

VII. Taking measurements for patterns.

VIII. Purchase of materials, patterns, findings.

IX. Shrinking material and belting.

(See Section I, Unit 1, Lesson II.)

Lesson II: Demonstration and Classroom Practice.

I. Testing pattern (figs. 14, 24). See Section I, Unit 2, and Section II, Unit 2.

II. Cutting garment.

A. Open material, straighten ends, and fold cut ends together.

B. Place pattern on material until most economical way is found; then pin to place.

C. Observe directions for cutting which accompany pattern.

D. If tucks or plaits are desired which are not allowed in the pattern, these must be placed in the material before any cutting is done. Do not cut notches.

III. Marking.

- A. Trace seams; mark notches, center front and center back, points for trimming, etc., with colored thread.

IV. Basting.

- A. Prepare belting or body lining to which skirt is to be attached.
- B. Baste all tucks or plaits to place if not already stitched in.
- C. Baste all seams in waist, skirt, and sleeves.
- D. Gather waist at bottom, sleeves at top and bottom, and skirt at the top.
- E. Turn skirt up at lower edge; pin.
- F. Place a temporary collar and cuffs of some soft lining material.
- G. Pin or baste skirt to belt or body lining.

*Lesson III.***I. Fitting.**

- A. Place dress on figure and look first for general lines of garment and ease of fit.
- B. Fit waist. (*See Section II, Unit 2, Lesson III.*)
 - 1. Fit neck and see that waist does not wrinkle anywhere.
 - 2. Mark armhole line.
 - 3. Take in or let out extra fullness at seams.
 - 4. Arrange gathers to band or belt at waist line.
 - 5. Pin sleeve to place.
 - 6. Notice length of sleeve and fit cuff.

C. Fit skirt.

- 1. See that skirt is full enough over hips and at bottom.
- 2. See that center front and center back fall in vertical direction.
- 3. Notice that side breadths do not swing either to back or front.
- 4. Adjust plaits or gathers to fit figure and so that they fall straight and evenly.
- 5. Mark line at bottom or if skirt is a straight one with hem already placed, adjust at belt until it is an even distance from the floor.

II. Make alterations. (*See Section I, Unit 2, Lesson III.*)**III. Refitting.**

- A. See that all alterations are properly made before finishing garment.

*Lesson IV.***I. Stitching and finishing seams.** (*See Bibliography.*)

- A. Finish throughout should be uniform.
- B. Types of finish.
 - 1. French seam, except for placing sleeve in armhole.
 - 2. Plain seam.
 - a. Overcast.
 - b. Bound at armhole.
 - 3. Entre deux or other insertion set in with fine French seams.
 - 4. Covered cord or pipings set in plain seam—overcast.
 - 5. Machine hemstitching.
 - 6. Lace or embroidered insertion set into seams.

NOTE.—All tucks and plaits ending in seams must be placed before seams are stitched.

*Lesson V.***I. Plackets.** (*See Bibliography.*)

- A. Continuous bound placket (narrow). (*See Section I, Unit 2, Lesson IV.*)
 - 1. This will be satisfactory in heavy materials or very full skirts where the finish will not show through.
 - 2. Use same material as dress to make placket.
- B. Faced with lace finishing braid or net and snapped together with very small snaps.

*Lesson VI.***I. Finishing skirt at waist line.****A. To be worn with extra belt or girdle.**

1. Fullness in skirt at waist may be taken up in gathers, tucks, or plaits.
 - a. If gathers, two or three rows of threads should be run $\frac{1}{4}$ to $\frac{1}{2}$ inch apart.
 - b. Tucks should be stitched and plaits basted.
2. Waist should be gathered at waist line.
3. First baste waist, then skirt, to belting, either at regulation or raised waist line, as planned for.
4. Stitch and cover raw edge with binding.
5. The raw edge may be trimmed, turned under and stitched to the belting with two rows of stitching.

B. To be worn without extra belt or girdle.

1. The upper edge may be turned under and shirred with several rows of shirring or it may be finished with a cord or piping to correspond with the other seams of the dress, or a girdle of the material may be made and the waist and skirt attached to the edges.
2. The skirt may be attached to a semifitted foundation body lining.

*Lesson VII.***I. Laying and finishing hem.****A. Reverse hem. (See Bibliography) Demonstrate.**

1. Turned to right side and finished with stitching, cording or piping.

B. Plain hem (figs. 10, 11).**C. Faced hem. (See Bibliography.)****D. Band and folds.**

1. Stitched.
2. Slip stitched.

*Lesson VIII.***I. Belt or girdle.**

- A. This may be of the same material as the dress and finished to correspond.
- B. It may be of ribbon and may or may not be attached to a foundation.
- C. Bits of silk or ribbon which have been left from other garments or which are not too badly soiled to respond to freshening processes may be used.

*Lesson IX.***I. Placing cuff or other wrist finish.**

- A. Trimness at the wrist adds much to the appearance of a waist.
- B. Seams corresponding to rest of dress.

II. Making and placing collar.

- A. Finish for standing collar to correspond with cuff.
- B. Flat collar (Section II, Unit 2, Lesson IV).
 1. Flatten seam and cover with bias facing on wrong side of waist.
- C. Small bits of left overs from other garments often make attractive collars and cuffs.

III. Closing.

- A. Buttons and loops.
- B. Buttons and buttonholes.
 1. Buttonholes lengthwise of material in front closing in box plait; crosswise in hem.
 2. Buttonhole crosswise of material in back closing.
- C. Fancy buttons.
- D. Hooks and eyes and snaps.

NOTE.—If the student desires she may work this problem as a problem in remodeling rather than purchasing new material. Wherever possible conservation should be encouraged. Let students use materials and trimmings on hand if they are worth it.

UNIT 4.—CARE, REPAIR, AND RENOVATION OF WASHABLE GARMENTS.

Lesson I: Lecture, Discussion, Demonstration, and Classroom Practice

- I. General care and repair of washable garments. (*See Section I, Unit 4: Where this work has previously been covered by the class it need not be repeated.*)
- II. Renovation (washable garments to be brought from home for this purpose).
 - A. Examination of garments to determine—
 1. Value.
 2. Kind of treatment necessary.
 - a. Ripping or cutting apart.
 - b. Spot and stain removal.
 - c. Laundering.
 - d. Bleaching.
 - e. Dyeing.
- III. Stain removal. (*See Bibliography.*)
 - A. Common household agents and their effect upon the four principal fabrics.
 1. Acids—hydrochloric and oxalic.
 2. Alkali—ammonia, borax, washing soda, soaps, etc.
 3. Bleaching agents—hydrogen peroxide, and javelle water.
 4. Solvents—gasoline, benzene, chloroform, and alcohol.
 - B. Use of the above in removing common stains and spots from cotton, linen, silk, and wool garments.
- IV. Laundering of clothing and household linen. (*See Bibliography.*)
 - A. Simple equipment and its use.
 - B. Discussion of bluing and soaps.
 - C. Preparation of starches and washing solutions.
 - D. Discussion of the effect of heat and cold and cleansing agents on the four principal fabrics.
 - E. Setting color.
 - F. Method of dealing with laces and fine garments. (*See Bibliography.*)

Lesson II.

- I. Dyeing.
 - A. Equipment.
 - B. Dyes for home use.
 1. Boiled dye.
 - a. Diamond, Rainbow, E. Z
 2. Instantaneous.
 - a. Tintex, dye soaps, etc.
 - C. Mixing, blending, and topping.
 1. Importance of choosing color of same order as already used.
 - D. Dyeing.
 1. Preparation of dye bath.
 2. Wetting material.
 3. Boiling (wool and silk should not be heated to the boiling point).
 4. Rinsing.
 5. Setting color.
 6. Drying.
 7. Pressing.

NOTE.—Suggestions for remodeling garments will be found in Lesson 2, Unit 4, Section III, and in the list appended, to the lessons on conservation of clothing, p. 100.

Section III.—Advance Dressmaking.

The purpose of this section is—

I. To teach women the principles of design and construction of (1) a wool dress, (2) a party dress, and (3) the economic value and method of using a dress form.

A. Designing dresses.

1. Wool dress.

2. Party dress.

B. Selection of material.

1. Suitability to design.

2. Suitability to wearer.

3. Suitability to occasion.

C. Use of pattern (wool dress).

1. Interpretation.

2. Adaptation.

D. Use of dress form.

1. Preparation lining.

2. Padding form.

3. Principles of draping.

E. Application of principles of draping.

1. Use of dress form in draping party dress.

F. Process of cutting, basting, fitting, and altering garments.

G. Process of making and finishing garments.

II. To teach economy and aid in conservation of textile fibers

A. Care.

B. Repair.

C. Renovation.

D. Remodeling.

} Silk and wool garments.

III. Appreciation of color, line, form, and texture.

IV. Appreciation of the value of technical skill and of labor.

UNIT I.—WOOL DRESS.

(See Bibliography.)

NOTE.—This group of lessons may be used to teach the conservation of old garments by remodeling instead of buying new materials. See suggestions for course of lessons on conservation of clothing, p. 100. Also Section III, Unit 4.

If desired, the lessons on the making and use of a dress form (Section III, Unit 2) may be used in connection with this unit.

Lesson I: Introductory Lecture, Discussion, and Demonstration.

I. Use of garment.

A. Business dress.

B. School dress.

C. Street dress.

II. Types.

A. Skirt and waist (joined at belt).

B. One piece (cut in one).

III. Materials.

A. Suitable kinds.

1. Business dress.

2. School dress.

3. Street wear.

} Serge, gabardine, jersey, tricotine.

III. Materials—Continued.

B. Method of testing. (*See Bibliography.*)

1. Testing for strength.
 - a. Effect of pulling.
 - b. Effect of rubbing.
2. Test for crocking.
3. Test for adulterations.

C. Study of the preparation and manufacture of wool, especially spinning, weaving, dyeing, and adulterations, and its relation to conservation. (*See Bibliography.*)

IV. Decoration (materials for).

- A. Silk, satin, velvet used for collars, cuffs, girdles, sleeves, etc.
- B. Braid, buttons, silk or wool embroidery, cable stitching, cord (for girdles).

V. Accessories (materials for).

- A. Collar and cuffs of organdie, linen, piqué, satin.

VI. Findings.

- A. Silk thread to match material, belting, hooks and eyes, snap fasteners, prussian binding, taffeta seam binding, net or china silk for protection lining.

VII. Design.

- A. Chosen for simplicity.
- B. Suitable to wearer.
- C. Suitable for occasion.
- D. Adaptable to material.
- E. Pattern selected to carry out design.

VIII. Computations.

- A. Quantity of materials.
- B. Quantity of trimming.
- C. Quantity of findings.
- D. Entire cost.
- E. Comparison with cost of ready-made.
- F. Comparison with budget allowance.

IX. Taking measures for pattern.

X. Purchase pattern, material, trimmings, and findings.

XI. Sponging material.

Lay on wet sheet; roll; leave over night; press on wrong side (with damp cloth over material) until dry.

XII. Equipment to be provided. (*See Introduction, p. 10.*)*Lesson II: Demonstration and Classroom Practice.*

I. Testing pattern (figs. 14, 24).

- A. Skirt pattern. (*See Section I, Unit 2, Lesson II.*)
- B. Waist pattern.

1. Test pattern according to measures taken. (*See Section II, Unit 2, Lesson II.*)
2. After alterations are made, pin pattern together on seam lines, try on figure to ascertain if correct.

II. Cutting dress.

- A. Prepare material; place pattern; cut dress. Do not cut notches. (*See Section II, Unit 3, Lesson II.*)

III. Marking seams.

- A. Mark with tailor basting. Also, mark notches, places for trimming; center front and center back with line of colored thread.

IV. Basting seams.

- A. Assemble part of dress according to directions on pattern. Pin all seams so tracings meet.
- B. Keep bias edges uppermost. Use small stitches where there will be strain in fitting.
- C. Turn skirt up at lower edge; pin.

V. Home work—Basting dress for fitting.*Lesson III.***I. Fitting dress.**

- A. Place belt on figure. Adjust protective lining to belt.
- B. Place waist on figure; adjust fullness to belt; fit where necessary.
- C. Pin skirt to belt, adjusting fullness, and placing seams in good position. Fit where necessary.
- D. Fit collar and cuff.

II. Alterations.

- A. Remove dress from figure and make alterations. (See Section I, Unit 1, Lesson II.)

III. Home work.

- A. Complete alterations and stitch protective lining to belt; finish at neck and armhole with hem or facing and narrow lace; place snap fasteners. Gather waist and skirt where marked in fitting.

*Lesson IV.***I. Second fitting; try dress on; see that alterations are correct.****II. Seams; suitable kinds. (See Bibliography.)**

- A. Plain.
- B. Cord.
- C. Tuck.
- D. Welt.
- E. Slot.

III. Methods of making.

- A. Plain. (See Section I, Unit 1.)
- B. Cord (fig. 26).

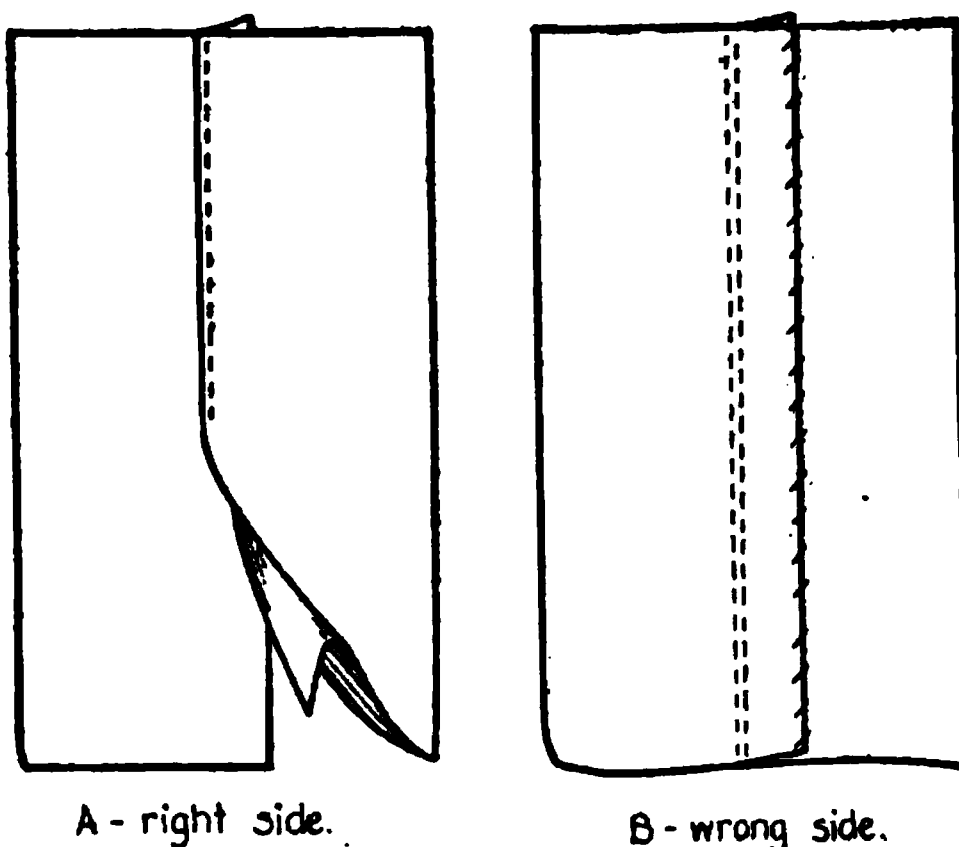


FIG. 26.—Cord seam.

1. Stitch plain seam.
2. Turn both raw edges of seam in one direction and stitch on outside, close to seam.

III. Methods of making—Continued.

C. Tuck (fig. 27).

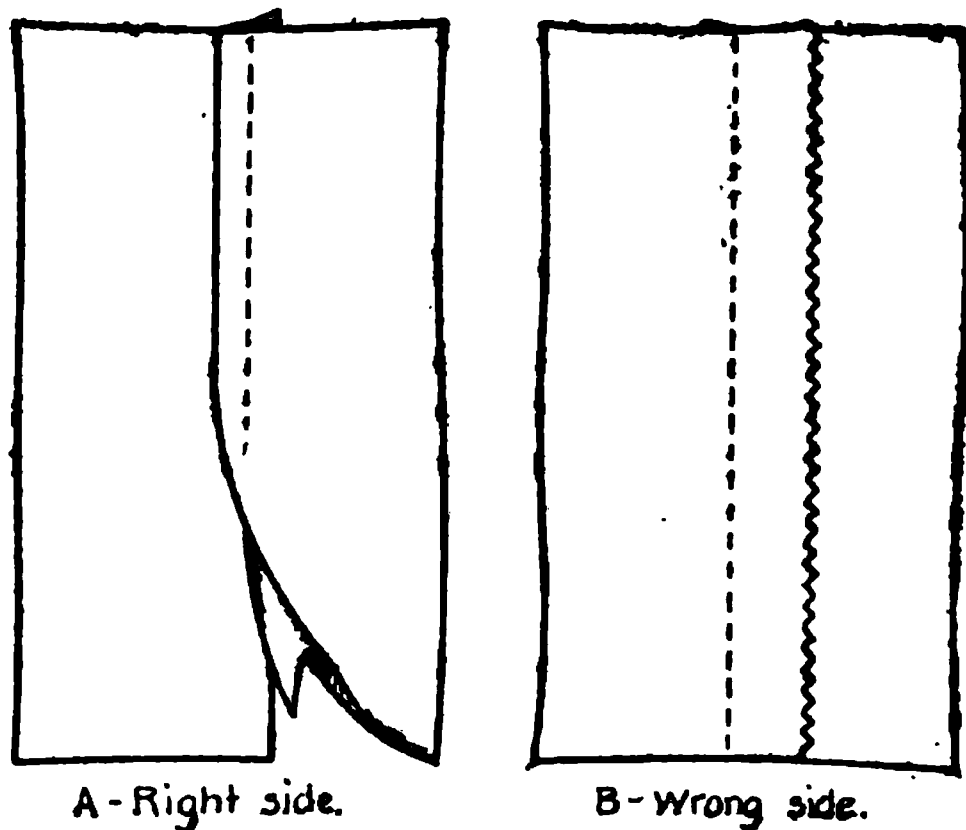


FIG. 27.—Tuck seam.

1. Turn and baste tuck on edge of one gore.
2. Lay folded edge to seam line of other gore; stitch as far from edge as desired.

D. Welt (fig. 28).

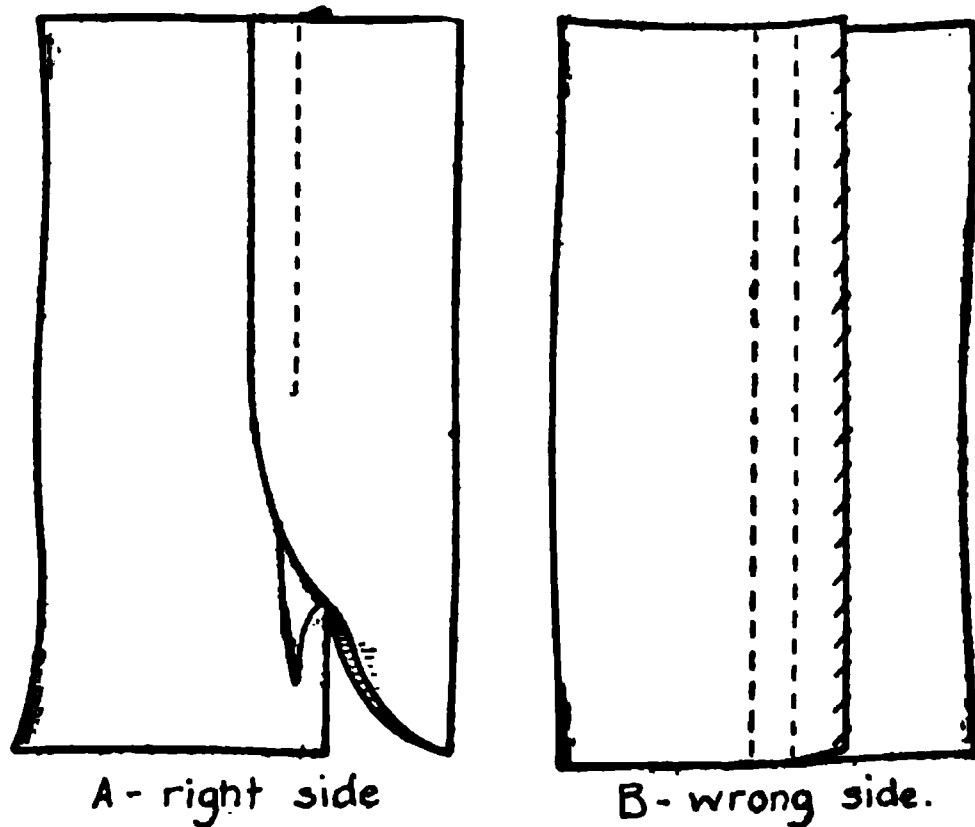


FIG. 28.—Welt seam.

1. Like cord, only stitched farther from edge.

E. Slot (fig. 29).

1. Two tucks meeting over a straight strip of cloth; stitch both back from edge.

IV. Pressing seams.

- A. Lay seam to be pressed on pressing board, cover with wet press cloth and press well with warm iron.

V. Finishing plackets. (See Bibliography.)

A. Kinds of plackets.

1. Under tuck opening.
2. Bias seam.

V. Finishing plackets—Continued.

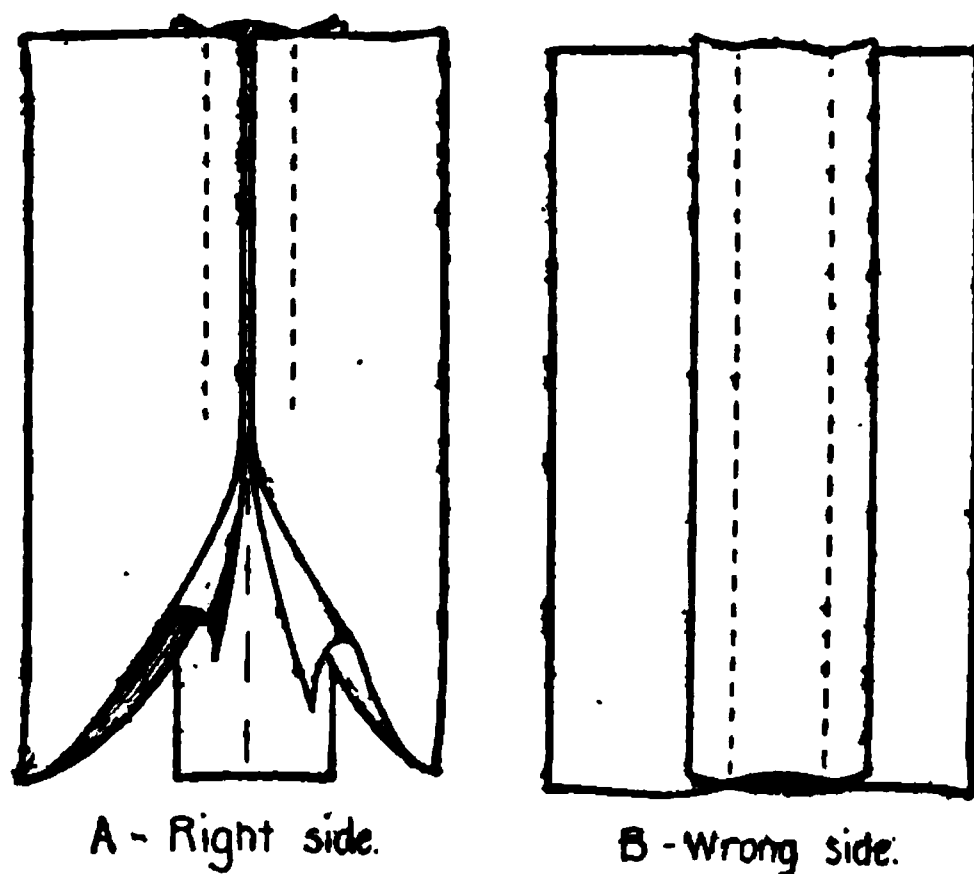


FIG. 29.—Slot seam.

B. Method of finishing.

1. Place Prussian binding inside placket for snap fasteners.
2. Facing (silk; satin or taffeta ribbon).
3. Finish lower end.

Lesson V.

I. Stitching—finishing seams of waist.

A. Suitable kinds.

1. Plain—overcast (fig. 16).
2. Plain bound (taffeta binding) (fig. 30).

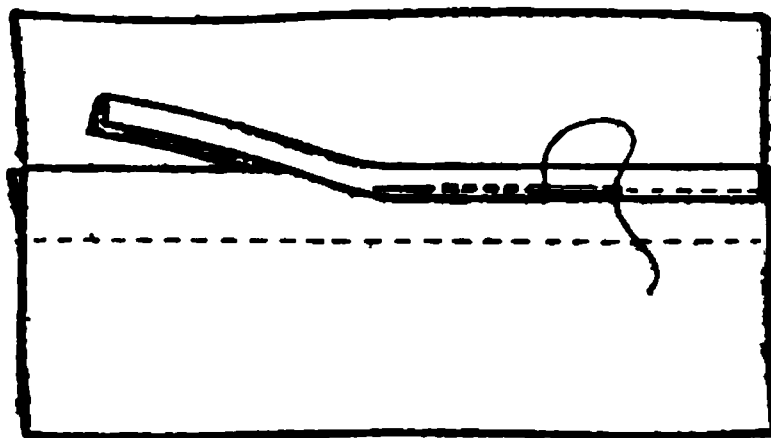


FIG. 30.—Binding edges of seam.

3. Cord—overcast (fig. 26).
4. Welt—overcast (fig. 28).

B. Method of making. (*See Lesson IV.*)*Lesson VI.*

I. Sleeves.

A. Making sleeves.

1. Stitch and finish seams (plain, and overcast or bound).
 - a. If seam of sleeve is on line of underarm seams, as many are, place sleeve in waist before stitching underarm seam.
2. Face lower edge.
 - a. Bias facing, stitched to sleeve, turned to wrong side and finished with blind hemming.

I. Sleeves—Continued.

A. Making sleeves—Continued.

3. Set sleeve in armhole, having notches meet; gather fullness between notches, fasten thread, shrink out fullness before basting; lay top of sleeve over tailor cushion, dampen well, and with warm iron work out fullness, working on wrong side of material.
4. Baste sleeves to place.
5. Stitch.
6. Bind seams with taffeta seam binding.

Lesson VII.

I. Finishing front of waist.

A. Hem.

1. Place Prussian binding for snap fasteners.
2. Do not turn edge of front in; overcast, pink or bind with taffeta binding.
3. Finish by stitching, catch-stitching, or blind hemming. (See Section 1, Unit 1, Lesson III.)
 - a. Blind hemming same as plain hemming except that needle takes up only single thread in garment so it will not show on right side.

B. Facing—surplice opening or side fastening.

1. Facing.
 - a. In either case cut the facing on the same grain of the material as the front of the waist, or else a half bias; place right side of facing to right side of waist; baste, stitch and turn to wrong side and blind hem the edge.
2. Snap fasteners.

II. Place protection lining on figure, then waist of dress; pin waist to belt adjust fullness; remove waist.

III. Home work.

A. Sew waist to belt—finish facings or hem on front.

Lesson VIII.

I. Hanging skirt.

- A. Place waist on figure; pin skirt to belt on line near top of belt indicated in fitting; adjust fullness.
- B. Turn line at bottom.
 1. Various ways of turning line.
 - a. Hem marker, ruler, tailor's square, marking hip line and measuring from that.

II. Hems.

- A. Turn on finished line.
- B. Trim hem even depth.
- C. Gather fullness at top and draw thread to make hem fit skirt.
- D. Shrink out fullness.
- E. Baste Prussian binding (shrink first) to top of hem; stitch.
- F. Blind hem top of Prussian binding to skirt, or stitch as desired. (See Bibliography.)

III. Home work.

A. Finish hems; also cover belt where skirt and waist join with strip of silk.

Lesson IX.

I. Collar, cuffs, girdle.

A. Test collar, cuffs, and girdle.

I. Collar, cuffs, girdle—Continued.

- B. Try other designs; the outer edge of the collar and cuffs is most important, as they may make or mar the entire costume. Try different types of girdles also. (Excellent material for renovation and remodeling.)
- C. Cut collars double or single as desired. If double, place right sides together, stitch, turn right side out, baste along fold; press; finish with bias band, so as to be removable; if attached to dress, baste in place before facing waist. Treat cuffs in same way as collar.
- D. Girdle may be either double or single.
 - 1. Double, treat same as collar.
 - 2. Single, catch stitch edge, hem or machine hemstitch and picot it.

II. Home work.

- A. Finish collar, cuffs, and girdle.

Lesson X.

I. Finishing dress.

NOTE.—Allow this lesson for those having incomplete work to ask questions, have additional help, etc., as this is a difficult problem.

II. Students who have finished may bring in something from home to work out independently.

III. Home work—complete wool dress.

Lesson XI.

I. Class criticism of dresses.

- A. Students put dresses on.
- B. Teacher calls on individual students for expression of opinion about design and technique, use of materials, etc.
- C. Allow others to offer suggestions.
- D. Teacher should conduct this lesson with care to encourage constructive criticism.

UNIT 2.—DRESS FORM.

(See Bibliography.)

Lesson I: Introductory Lecture, Discussion, and Demonstration.

I. Use of form.

- A. For purpose of draping simple waists and dresses.
- B. An aid in home dressmaking.
- C. Conservation of time and labor.
- D. An aid to appreciation of good design in dress, through experimentation.

II. Equipment needed.

- A. Dress form (smaller than bust measure).
 - 1. Kinds.
 - a. Simple papier-mâché.
 - b. Adjustable (for all sizes of people).
 - c. Pneumatic (rubber; expanded by air; collapsible when not in use).
- B. Sewing equipment (see Introduction p. 10).

III. Materials.

- A. Practice material.
 - 1. Cambric, unbleached muslin, chambray.
 - a. Chambray is not much more expensive than unbleached muslin and can be used as house dress later.
- B. Materials for simple wash dress:
 - 1. Chambray, gingham, lawn, voile, Indian head, linen, dimity.

IV. Design.

- A. Study of line.
- B. Accuracy.
- C. Simplicity.

V. Computation of materials.

- A. Judgment on basis of measurements of form and amounts used in previous problems.

VI. Pattern for tight fitted lining.

- A. Measurements.
- B. Purchase of pattern and material for lining.
- C. Preparation of lining at home.

Lesson II: Demonstration and Classroom Practice.

- I. Fitting waist and sleeve linings, already basted.
- II. Alterations.
- III. Second fitting.
- IV. Stitching, pinking, pressing seams.
- V. Home work—finish linings.

Lesson III.

- I. Padding form (fig. 31).
 - A. Try lining on form; note where most padding will be needed.
 - B. Wrap form with tissue paper until lining will set smoothly over it.
 - C. Pin lining down center back.
 - D. Pad sleeve lining with tissue paper until it is perfectly smooth, shapely and firm, but not hard. Cover top and bottom with oval pieces of cloth.
- II. Home work.
 - Buy practice material for designing, also material for simple wash dress; find design for dress; bring several tracings of design.

Lesson IV.

I. Draping.

A. Shirt waist (fig. 32).

- 1. Cut off two lengths of material for fronts of waist and one for back; measure from highest point of shoulder, at neck, to length desired (usually 2 to 4 inches below waist line; 2 inches for corset cover, 4 inches for shirt waist).
- 2. Lay hem on one edge of each side of front; mark center of hems and center of back with colored thread (entire length). If box plait is used, lay it and hem on opposite side.
- 3. Front.
 - a. Place center of hem or box plait to center of form (right-hand side); pin to place; leave enough material at shoulder and neck to allow for seams. Grain of material straight across chest; pin at armhole and shoulder, lay backward turning plaits at waist; smooth material to underarm; pin along seam line. Use shoulder line of lining and center of under arm piece as guides for location of seams. Place line of pins to mark the armhole.
- 4. Back.
 - a. Place center line of back to center of form. Pin to form; smooth material across form, in shoulder seams, clip neck; lay forward turning plaits at waist; pin underarm seam, mark armhole with pins.

FIG. 31.—PADDED DRESS FORM.

FIG. 32.—DRAPING SHIRT WAIST.

I. Draping—Continued.

A. Shirt waist—Continued.

5. Cut out at neck and armhole, allowing seams; trim away extra material at underarm, shoulder seams, and bottom of waist.
6. Turn back center front on desired line.
7. Collar.

Note.—Block out in practice material first (cambric, cheesecloth, paper, etc.).

a. Flat collar.

- (1) Mark center of piece of cloth, lay to center back of waist; curve out neck, and follow line of front opening. Mark line for outer edge with pins or pencil.

b. Flat collar with roll at neck.

- (1) Block neck line out roughly at first not as deep a curve as other collar; pin to place and fit until desired roll is secured; outer edge marked like other collar.

8. Remove waist from form; mark points for placing collar.

II. Home work.

- A. Remove collar; trace seams of waist, open and cut other side like it; rebaste; cut other side of collar like first; baste to place.

Lesson V.

I. Sleeve (fig. 33).

- A. Take piece of cloth length of sleeve form, plus seams; pin to form so lengthwise thread follows a lengthwise thread of lining on upper sleeve; smooth cloth around upper part, leaving same fullness if desired; locate seam either directly under arm or a little forward. Pin seam in place from top to bottom; clip material to let it spring; trim away unnecessary cloth. From the elbow to wrist, the extra fullness may be folded away in a dart, or gathered into a cuff at the waist; remove from form; baste for fitting.

- B. Drape other types of sleeves. Follow designs in fashion books, or originate.

II. Home work.

- A. Baste sleeves for fitting.

Lesson VI.

I. Fit waists and sleeves.

II. Skirts (fig. 34).

A. Circular skirt. (See Bibliography.)

1. Take length of practice material (8 to 10 inches longer than skirt length) or tissue paper; mark center front; curve out slightly at top of center front; pin to band at waist; allow as much extra cloth at top as necessary; pin material down center front to keep line straight; begin to raise or lower material at waist line according to amount of flare desired; pin to place at waist; fold material over in center back to mark seam line; mark line at bottom.

- B. Remove skirt and cut other side like first; baste for trial fitting.

III. Six-gored skirt.

- A. Cut length of material for front gore; mark center front with colored thread; measure desired width of gore at hip and bottom; hold tape measure and mark line for edge of gore with pins; cut 1 inch beyond pins; fold under on line of pins; cut out at waist, allow for seam.

III. Six-gored skirt—Continued.

- B. Cut second length of cloth; slip straight edge under the folded edge of front gore; allow 1-inch seams; pin to front gore and at waist; cut out at waist to fit curve; allow 1-inch seam; baste one-half inch from fold to make panel; mark line for hip seam with tape and pins; cut extra cloth away; allow 1-inch seam.
- C. Cut third length of cloth; place straight edge to gored edge of second gore allow 1-inch seam; pin seam as in waist on outside; cut out curve at waist; allow plenty of material for gore plus seam allowance and cut away extra material (this gore should measure the same as the second).
- D. Cut fourth length of material; mark center; pin to band at waist; curve for waist; mark and fold for back gore same as front; lay over back of third gore and pin seam.
- E. Turn line at bottom.
- F. Remove skirt; trace seams; cut other side gores from remaining cloth.

IV. Home work.

- A. Baste skirts for fitting. Baste sleeves in waist according to marks placed in fittings.

Lesson VII.

I. Draping dress.

- A. Follow design chosen; apply principles learned in previous lessons on draping; drape dress and collar.

II. Home work.

- A. Baste dress for fitting; drape sleeve and baste to place.

Lesson VIII.

- I. Class criticism of designs just completed. See Section III, unit 1, Lesson XI.

UNIT 3.—PARTY DRESS.

Lesson I: Introductory Lecture, Discussion, and Demonstration.

I. Use of garment.

- A. For wear to afternoon or evening parties, dances, receptions, dinners, etc.

II. Types.

- A. Afternoon parties, receptions, teas, and very informal evening functions.

- 1. Style.

- a. Round, square, or V neck finished at regulation height; sleeves wrist length or three-fourths length.

- 2. Materials.

- a. Organdie, voile, batiste, georgette crepe, taffeta, satin, crepe de chine, etc.

- 3. Color.

- a. For summer—Light, dainty colors, in soft, cool-looking materials, are best.
 - b. For winter—Colors should be of duller, warmer tones. Avoid solid masses of bright colors, especially in taffetas and satins.

- B. Evening receptions, dances, dinners of a more formal nature.

- 1. Style.

- a. Low neck, short sleeves (decolleté for formal occasions).

- 2. Materials.

- a. Chiffon, georgette crepe, crepe de chine, taffeta, satin, crepe meteor, messaline, tulle, etc.

II. Types—Continued.**B. Evening receptions, etc.—Continued.****3. Colors.**

- a. Light or very bright colors are attractive for young girls, while softer, richer tones, either light or dark, are becoming to the more mature woman.

III. Discussion of materials.**A. Relative durability—testing silks for weighting and adulteration.**
(See Bibliography.)**B. Relative cost.**

1. If dress is of type which is to be worn but very few times it will not be wise to buy the more expensive grades of silk. This is practically the only occasion where cheaper grades of materials are economical.

C. Appropriateness to occasion.**D. Suitability to design and wearer.**

1. Draping quality.
2. Luster, etc.

IV. Decoration.**A. Types.**

1. Self trimmings. (See Section II, Unit 2, Lesson I.)
2. Ribbons. (See Section II, Unit 3, Lesson I.)
 - a. Handmade flowers and buds from bits of ribbon, silk, velvet, etc., make very effective touches of another color. (See Section V, Unit 2, Lesson II.)
3. Beaded, embroidered or stenciled designs add a very attractive touch, if not too elaborate.
4. Fur and maribou bands have a softening effect.
5. Many of the best looking dresses are without ornamentation of any kind other than the artistic effect secured by graceful folds or draperies and beautiful combinations of materials and colors.
6. Simplicity and harmony should be the keynotes in all decoration.

B. Suitability of types of decoration to type of garment.**C. Durability.****D. Cost in money or time used for making.****V. Comparison of homemade with ready-made dresses of these types.** (See Section II, Unit 2, Lesson I.)**VI. Design.****A. (See Section II, Unit 3, Lesson I; also Bibliography.)****B. The richness of materials used in dresses of this type make it all the more necessary to keep the design simple and graceful in line. The softness and clinging quality of many of the materials is their greatest charm, and if these materials are allowed to fall in self folds from the natural points of support little else need be considered. Such dresses must fit easily and must express harmony and unity throughout. This problem is to be one which will give practice in the use of the dress form in garment construction, and design. The dress is to be made without the aid of a commercial pattern, therefore a design which is easy to carry out should be selected, preferably for a summer, afternoon, or party frock or one of the simple dance frocks for young girls.****VII. Findings.****A. (See Section II, Unit 3, Lesson I.)**

VIII. Computations.

A. (See Section II, Unit 3, Lesson I; make applications where possible.)

IX. Purchase of materials, findings, etc.

Lesson II: Demonstration and Classroom Practice.

I. Draping lining (drape in lining net).

A. Shirt waist type. (See Section III, Unit 2, Lesson IV.)

B. Camisole lining.

1. Place belting, which has been made to fit waist line, on dress form at waist line.

2. Straight camisole with shoulder straps.

a. Decide where opening is to come and indicate line on figure with pins.

b. Pass material over the chest and under the arms in such a manner that a straight thread of the material runs exactly at right angles to the center front line on the form.

Pin the material frequently to the form to hold it in the proper position.

c. Arrange for hems at closing.

d. Pass material in same way across back. Fit snugly and take out fullness at the bottom in darts, until lining fits figure. Sometimes these linings are seamed under the arms. Pin all seams and darts on finished line and cut a generous allowance on all seams for alterations in fitting. Do not cut darts.

e. Make narrow straps of lining net (double), to pass over each shoulder and join to both front and back to support lining.

f. Baste on line of pins.

g. Fit to figure for which dress is being made.

h. Make alterations.

i. Finish seams, darts, and hems.

j. Finish edges with lace finishing braid.

k. This foundation serves as a stay for girdles and for fastening folds and draperies.

3. Camisole with fitted armhole and higher neck line.

a. Cut straight piece of material long enough to reach across shoulders from center front to center back, plus enough for a generous seam, with the upper part of a straight camisole line.

b. Fit over shoulders and around the arm to underarm seam. Notch at armhole far enough to fit. Indicate finishing line with pins.

c. Fit lower part as before.

d. Baste, fit, alter and finish as before. The lining is now ready to attach to the garment.

Lesson III.

I. Draping pattern for dress.

A. The dress should be draped in tissue paper and when the desired effect is secured this paper dress may be taken apart and the pieces used as a pattern for cutting the dress itself from the material.

The paper should be prepared with heavy lines indicating, clearly, the direction of warp and woof threads. This will avoid trouble when it comes to working the dress out in material.

NOTE.—Other mediums, cheesecloth, etc., similar in texture to material of dress, may be used for this pattern.

FIG 33.—DRAPING SLEEVES.

FIG. 34.—DRAPING OF SKIRTS.

I. Draping pattern for dress—Continued.

B. Study carefully picture of dress to be designed, to discover the location of the openings and seams.

C. Decide how all edges are to be finished.

D. Before beginning to drape, handle several different kinds of material lightly to get an appreciation of the following facts.

1. Folds made on a lengthwise thread press flat, giving sharp, rather harsh lines. Folds for edges of plaits which are to be pressed to place should be made with this grain.
2. Folds made on the crosswise thread do not retain as sharp an edge. They round out and are not very graceful and do not stay pressed.
3. Bias folds will not crease flat and so for purposes of draping are the most graceful of the three types.
4. The way the grain is to be handled must be determined before draping is commenced and then adhered to throughout the costume. There must be no deviation from the plan or the work will never look the same.
5. Never pull or tack folds where you wish them to go. Work with the material until it gives you the desired effect naturally, or if this is impossible change to some other design. A draped design which looks sewed to place is never good.
6. Do not handle material timidly in draping. Handle lightly to prevent mussing but work with firmness and assurance.
7. Notice that a few graceful folds are more attractive than many fine folds, which often reveal the labor which produced them.

E. Equipment.

1. In addition to the dress form and materials it is necessary to have and to use a good tape measure if the work is to be accurate, also plenty of pins and a pair of sharp scissors.

F. Draping foundation skirt.

NOTE.—The simplest type of dress for the beginner is one which has the foundation of messaline or other soft silk, with draperies of tulle or other transparent material. It should be made with a sleeve to give practice in sleeve draping.

1. Straight gathered skirt 2 to 2½ yards in width.
 - a. Cut two lengths of material, length of finished skirt plus hem and extra allowance for waist line finish.
 - b. Baste seams.
 - c. Adjust to belt, either at normal or raised waist line, as desired. Keep pins close together and insert vertically in belt.
 - (1) Notice that seams take good direction.
 - (2) Arrange fullness so that it falls gracefully about the figure, giving fullness where needed.
 - (3) Avoid too great fullness in center front.
 - (4) Plan place and depth of opening.
 - (5) Indicate line for turning hem.

*Lesson IV.***I. Waist and overdrapery.**

A. If waist is to have foundation of same material as skirt it may be draped either as the camisole or shirt waist type of lining.

Bias may be used for the camisole foundation to give a softer appearance. It will also drape to fit the figure better.

The waist will prove more attractive if arranged so that the upper part is composed only of transparent materials. Since the waists will vary in detail very few definite directions can be given. The student must experiment with the paper representing the combination of materials until a pleasing result is secured.

I. Waist and overdrapery—Continued.**B. Suggestions and cautions.**

1. Avoid visible seams wherever possible.
2. Make all folds which are used to fill in at the neck on the true bias to give softer line.
3. If a kimono sleeve is used be sure there is enough material left under the arm to allow plenty of freedom in motion.
4. Where a rippled effect is desired on an edge it can be secured by cutting or folding the edge on a bias.
5. The overdrapery of both waist and skirt may be confined at the waist line under a girdle made of bias material, or the waist drapery may extend down over the skirt.
6. Plan waist to conceal seam where waist and sleeve join at armhole.

II. Home work—Planning and designing decorations.*Lesson V.***I. Draping sleeves.**

- A. Be sure that the straight grain of the material falls in a straight line from shoulder toward elbow, and that the grain in the other direction passes in a straight line around the arm.
- B. The sleeve may be a short puff or cap sleeve, elbow or wrist length as desired, and may hang loose at the lower edge or be gathered in as desired.

II. Fitting.

- A. Remove finished dress from form and try on. Make alterations. Remember that the paper will not cling to the body as materials will.

*Lesson VI.***I. Preparing pattern for use.**

- A. With pencil indicate where pieces are to be joined when placed together again.
- B. Remove pins and lay pieces flat on table.
- C. Using yardstick and tracing wheel or pencil go over all seam and edge lines and correct irregularities. If the two sides are to be alike alter the pattern to make them so.

II. Cutting.

- A. Place corrected pattern on material. Be very careful to keep on same grain as marks on pattern indicate.
- B. Cut out, making generous allowance for seams, hems, etc.

III. Home work.

- A. Prepare foundation skirt for final fitting, and baste seams or waist together; prepare sleeves for fitting.

*Lesson VII.***I. Draping for fitting.**

- A. Place lining on form.
- B. Attach skirt to belt.
- C. Drape waist to place.
- D. Pin parts to place, being careful not to mar the material with unnecessary pins.

II. Fitting.

- A. Remove dress from form and try on.
- B. Make necessary alterations.
 1. Do not fit too closely to figure.
- C. Pin sleeves to place.

III. Finishing seams, plackets, closings, etc.

IV. Home work.

- A. Do not spend time on elaborate seam finishes in this type of dress. Plain overcast seams will answer in most places. Have foundation dress finished ready for draping.

Lesson VIII.

I. Edge finishes.

- A. Many dresses have no raw edges visible, being made up of folded pieces of material.
- B. Some edges, as in tulle, are left unfinished, and others having good-looking selvages simply use this for the finish.
- C. Bands of trimming, fringe, fur, or maribou may be attached.
- D. The edge may be machine hemstitched and cut away to form a picot.
- E. Edges may be turned back and blind hemming, beading, or ornamental stitching used to finish.

II. Replacing drapery.

- A. Replace finished foundation on form.
- B. Do as much of the final sewing of drapery as possible on the form, as a better effect can be secured. Take careful measurements when placing the drapery, and tack to place only where necessary.

Lesson IX.

I. Finish draping.

II. Place girdle and other decorations.

III. Finish dress, sew on fasteners, etc.

UNIT 4.—CARE, REPAIR, RENOVATION AND REMODELING OF SILK AND WOOL GARMENTS.

Lesson I: Lecture, Discussion, Demonstration, and Classroom Practice.

- I. General care and repair of garments. (See Sec. I, Unit IV. Where this work has previously been covered by the class it need not be repeated.)
- II. Renovation. (Silk or woolen garments to be brought from home for this purpose.)
- A. Examination of garments to determine—
1. Value of material for future use.
 2. Kind of treatment necessary.
 - a. Ripping or cutting apart.
 - b. Spot or stain removal.
 - c. Laundering.
 - d. Dyeing.
 - e. Cleansing with gasoline.
 - f. Removing shine.
 - g. Steaming.
 - h. Pressing.

(For methods of spot or stain removal, laundering and dyeing, see Sec. II, Unit 4. For directions for cleansing with gasoline, removing shine, steaming, and pressing see Bibliography, "Care and cleansing" and "Conservation.")

Lesson II.

I. Remodeling of simple garments.

- A. Suggestions for remodeling. (See Bibliography.)

NOTE.—The teacher should have good demonstration material, good suggestions from fashion sheets or clothing catalogues, of simple garments, attractive collars, cuffs, and girdles. See list of Suggestions for remaking garments, p. 101.

1. Children's underclothing made from adult garments.

- I. Remodeling of simple garments—Continued.
 - A. Suggestions for remodeling—Continued.
 2. Children's ~~outer~~ garments from adult garments.
 3. Remodeling adult garments.
 4. Remodeling household textiles, napery, etc.
- II. Examination of garments brought in for remodeling.
 - A. Choice of design—
 1. Suitable for materials on hand.
 2. Suitable for needs of wearer.
 3. Suitable for figure of wearer.
 - B. Choice for new material for combination with old.
 1. Suitable texture, quality, weight.
 2. Suitable color, pattern, finish.
 3. Estimate quantity of material necessary.
 4. Choice of pattern.
- III. Placing pattern on material so as to avoid unnecessary piecing.
 1. Study how to bring piecing in least noticeable places.
 2. Trimming and other possible ways of concealing piecing.
 3. Possible alterations of pattern to avoid piecing.
- IV. Piecing.
- V. Cutting.
- VI. Basting for fitting.

NOTE.—From this point on the garment should be made according to directions for a similar garment found elsewhere in the course. Instructions in technical processes will be found throughout the units.

Section IV.—Infants' and Children's Clothing.

The purpose of this section is:

- I. To teach women how to judge and select materials for infants' garments, children's undergarments, and dresses.
 1. Discussion of materials.
 2. Computation of quantities.
 3. Computation of costs.
- II. To teach the care of materials and garments (infants').
- III. To teach how to design garments for infants and children.
 1. Simplicity of type and decoration.
- IV. Construction and decoration of:
 1. Children's undergarments.
 2. Children's dresses.
 3. Conservation through renovation and remodeling of adult garments.
 - a. Use of pattern.
 - b. Processes of cutting, basting, making, and finishing.
- V. Construction of a boy's suit.
 1. Preparation of material.
 2. Use of pattern.
 3. Processes of cutting, basting, making, and finishing.
 4. Conservation, cutting from adult garments.

UNIT 1.—LAYETTE.

(See Bibliography.)

Lesson I: Introductory Lecture, Discussion, and Demonstration.

- I. Use.
 - A. To keep body of baby at normal temperature under all weather conditions.

II. Types and number of garments included.

- A. Flannel bands, 3.
- B. Knit bands with shoulder straps, 3.
- C. Knit shirts, 3 or 4.
- D. Diapers, 3 to 6 dozen.
- E. Flannel petticoats, 4.
- F. Cotton petticoats, 4.
- G. Dresses or plain slips, 8.
- H. Nightgowns, 3.
- I. Kimono wrappers, 2 or 3.
- J. Sacks, 2.
- K. Socks or long stockings, 3 or 4 pairs.
- L. Booties, if desired, 2 or 3 pairs.
- M. Small blankets, 3.
- N. Hood capes or cloak and cap, 1 or 2, or 1 of each.
- O. Mittens for winter, 1 pair.
- P. Sleeping bags, 2.

III. Bed covering.

- A. Sheets, 8.
- B. Pillow slips (for very small pillow), 4.
- C. Blankets (according to weather).
- D. Quilt (light-weight), 1.

IV. Bath accessories.

- A. Large, soft Turkish towels, 4.
- B. Wash cloths, soft Turkish toweling, 4.
- C. Soft cheesecloth, several pieces of various sizes, always clean and at hand.

NOTE.—All articles coming in contact with the baby's skin must be soft to prevent irritation.

V. Materials used in the layette.

- A. Baby flannel (test for wool).
 - 1. For bands, petticoats, etc.
 - 2. The best grades of all wool are not desirable for this purpose for they shrink more and are not so warm, being more compactly woven. Test for amount of adulteration in relation to price.
 - a. Wool test.
 - (1) Quick test. Nitric acid yellows wool fibers, which change to orange when ammonia is added.
 - (2) Boiling in Babbitt's lye solution (1 tablespoonful to cup of water) destroys wool.
- B. Bird's-eye, bleached light-weight cotton flannel, cheesecloth.
 - 1. For diapers.
- C. Fine cambric, batiste, and nainsook.
 - 1. For dresses, nightgowns, and petticoats.
- D. Challis, cashmere, albatross, etc.
 - 1. For sacks, kimonos, capes, cloaks, etc.
- E. Outing flannel may be used in place of woolen materials for all but the bands if one wishes to conserve wool or can not afford it.

V. Materials used in the layette—Continued.

F. Knitted articles of silk and wool or cotton and wool combinations.

1. Discussion of knitted garments.

a. All wool is too harsh, too warm, and shrinks too badly.

b. Silk and wool or cotton and wool are best.

(1) Medium weight best for cold weather.

(2) For very warm weather very light-weight mixtures of all cotton or silk stockinette should be used.

c. Types of knitted articles discussed.

(1) Knitted band with shoulder straps.

(a) To be worn when flannel band is discarded.

(b) Tab at bottom or sides to which diaper may be pinned.

(2) Shirt.

(a) Second size preferable.

(b) Worn over band.

(3) Socks and stockings.

(a) Socks for warm weather if desired.

(b) Stockings that reach above the knees for cool weather.

(c) Avoid having too small.

(d) Fasten to diaper with pins.

(4) Mittens.

(a) To be worn in cold weather. Fingers and thumbs all in one.

NOTE.—The knitted undergarments may be cut from discarded adult garments of good quality if it is desired to save wool or expense. Edges may be finished with crochet.

2. Care of knitted and flannel garments.

a. Wash carefully in lukewarm water and mild white soap solution; rinse through several waters until entirely free from soap. Keep rinse water same temperature as wash water. Dry in a warm place, putting all knitted garments over frames which come for the purpose. Press woollens on wrong side with warm iron. Extremes of heat or cold or strong soaps harden, shrink, and yellow the fibers.

G. Discussion of materials.

1. Relative warmth, weight, softness, shrinkage, conductivity, and absorption.

2. Relative durability.

3. Relative cost.

VI. Decoration.

A. Types.

1. Tucking.

2. Embroidery and fine needlework.

3. Insertions and edgings.

4. Bindings on kimono, sacks, blankets, etc.

B. Suitability and attractiveness.

1. Owing to frequency of laundering it is far better to omit ~~decoration~~ from the first garments.

2. If used it must be very simple indeed and then never around the neck or wrists to cause irritation.

VII. Design.

- A. Choose designs having as few seams, as simple finish, and as easy closings as can be found.
- B. Dresses should not be of extreme length.

VIII. Findings.

- A. Tapes, washable ribbons, small flat buttons, and small safety pins.

IX. Computations. (*See Section II, Unit 2, Lesson I.*)

X. Comparison of homemade with ready made.

- A. Design.
- B. Durability.
- C. Quality.
- D. Comfort and ease of adjustment.
- E. Appearance after laundering.
- F. Actual cost.

XI. Purchase of pattern, materials, and findings.

XII. Shrinkage of materials. (*See Section I, Unit 1, Lesson II.*)XIII. Equipment to be provided. (*See Introduction, p. 10.*)*Lesson II.*

I. Flannel undergarments, discussion and direction for making.

A. Abdominal band.

1. Worn until about the eighth week (for healthy child), then change to knitted band till child is about 2½ years. Worn day and night.
2. Cut strip of flannel from 6 to 8 inches wide by 18 to 20 inches long. A half yard of flannel will cut four bands, if cut lengthwise.
3. Leave edges unhemmed. Roll tightly and place three small safety pins ready for use.
4. When placing band, pin firmly but not tightly around abdomen.

B. Flannel petticoat.

1. For cold weather.
2. 26 inches in length, no more.
3. Cutting, marking, basting. (*See Section I, Unit 1, Lesson II.*)
4. Underarm seams.
 - a. Flannel fell (fig. 35), finished on wrong side (demonstrate).

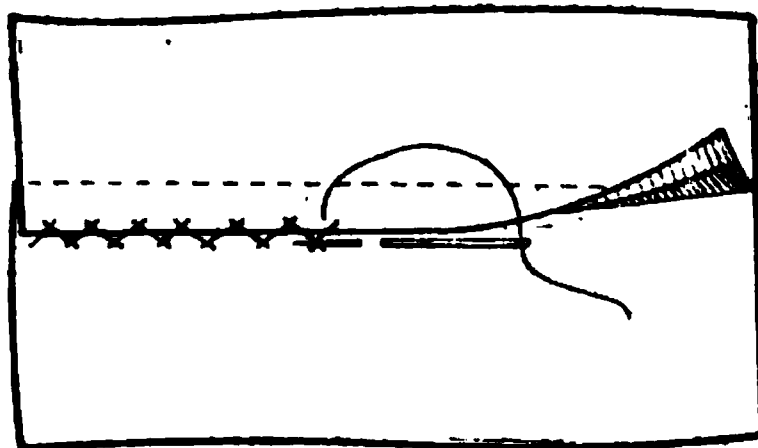


FIG. 35.—Flannel fell.

- (1) Stitch as for hemmed fell.
- (2) Trim underside close to stitching and upper side to ¼ inch.
- (3) Catch stitch raw edge flat to garment.
5. Edge finishes—bottom, neck, and armholes.
 - a. Scalloping.
 - b. Turn edge once to wrong side and catch stitch to place. If preferred, briar stitching may be done through the two thicknesses.

I. Flannel undergarments, etc.—Continued.

B. Flannel petticoat—Continued.

6. Shoulder closing.

a. Tapes—best method.

b. Flat buttons and buttonholes, 1 or 2 in each strap, or small safety pins.

C. Care. (See Lesson I, this unit.)

II. Diapers.

A. Never use a rubber diaper for extra protection. Use one of the Stork variety made of material resembling heavy Turkish toweling.

B. Shrink all diaper materials before cutting. Cut on straight thread.

C. Cut 18 by 36 inches and hem raw edges. This size will answer for the first three or four months, after which larger ones will be needed.

D. Small squares of cheesecloth 18 inches.

1. If these are doubled diagonally and placed inside the diaper they save considerable labor in washing.

E. Care of diapers.

1. When removed put to soak immediately in covered pail.

2. Wash, using mild white soap, boil, rinse thoroughly, let hang for a day in the air and sunshine. Iron lightly.

3. Never use starch or bluing in these or other baby clothes.

III. Cotton petticoat.

A. Twenty-six inches in length. (See previous cutting and basting directions.)

B. Seams.

1. Hemmed or stitched fell.

C. Edge finishes neck and armhole.

1. One-quarter inch hem, hemmed by hand.

D. Lower edge finish.

1. Two-inch hem, hemmed by hand or machine.

E. Shoulder closing.

1. (See Flannel petticoat.)

Lesson III.

I. Dress or slip and nightdress.

A. Dress 27 inches long, no more; nightdress 36 inches.

B. Seams (underarm, shoulder, and armhole).

1. Hemmed or stitched fell. All seams must have a flat finish for baby's first garments.

NOTE.—If the slip has a set in sleeve, extra fullness may be worked into the garment by means of inverted box plaits under each arm. This also allows for enlarging the armhole as the child grows and also makes straighter edges on seam.

C. Placket.

1. Without extra facing.

a. Slash center back desired depth.

b. At base of this slash make $\frac{1}{2}$ -inch crosswise slash on left side and $\frac{1}{2}$ inch on right side.c. Turn $\frac{3}{8}$ -inch hem on left side and $\frac{1}{2}$ -inch hem on right side. Hem by hand.

d. Fold right hem over left so that the line of hemming on the upper hem falls along the edge of the lower one.

e. Fold extra fullness in plait between the two hems and fasten with two rows of stitching, one each side of slash.

I. Dress or slip and nightdress—Continued.**C. Placket—Continued.****2. Bound and faced placket.**

- a. If a flat finish without fullness is desired at the back this type may be used.

3. Buttons.

- a. Use small flat linen or pearl buttons.

4. Buttonholes.

- a. Make horizontal, round end buttonholes.

D. Neck and cuff finish.**1. Binding $\frac{1}{2}$ -inch finished.** Be sure not to make too tight.**2. Facing—bias $\frac{1}{2}$ -inch finished, hemmed by hand.**

- a. Run ribbon or linen tape and draw up loosely about neck and wrist.

E. Hem.**1. Two-inch hem in dress hemmed by hand, machine or briar stitched.****2. One-inch hem in nightdress with tape run through to draw close at bottom, especially in cold weather.****F. Care of garments.****1. No garment should be used more than once without laundering.****2. Use only white soap for laundry purposes.****3. Rinse entirely free from soap.****4. Never use starch or bluing in infant's clothing. Rice water will give sufficient dressing, but even this is better omitted except in dress-up clothing.***Lesson FV.***I. Kimono wrappers and sacks.****A. Sacks may be knitted or crocheted if desired.****B. Cut and mark as other woolen garments.****C. Seams.****1. Baste.****2. Plain—overcast.****D. Finish at neck, cuffs, and front opening.****1. Cut band of material the same shape as the edge to be finished 2 inches in width.****2. Turn edges of kimono to right side and baste band flat over these with raw edges turned under and the edge of kimono and edge of band even.****3. Sew flat to garment.****4. Silk bindings are not as serviceable as bands of material similar to the garment would be, for they do not look well after washing.****E. Hem.****1. Turn and hem by hand 2-inch hem****F. Fastenings.****1. Tapes or hooks and eyes may be used.****II. Bootees.****A. These may be knit or crocheted.****B. Cut according to pattern.****C. Finish all seams with stitched fell.****D. Fasten with buttons or ribbons.****III. Blankets.****A. Made from 1 yard of flannel bound on the four edges.****B. Ribbon may be used as a binding.**

IV. Hood capes.

- A. Face front rounded edge of hood with bias facing.
- B. Plait or gather to head size.
- C. Gather lower edge of hood.
- D. Turn sides and bottom of cape once and catch stitch.
- E. Gather upper edge of cape.
- F. Lay hood and cape right sides together and stitch.
- G. Turn seam down on cape and face with bias facing or ribbon.
- H. Fasten with cord, ribbon, or hooks and eyes.

V. Knitted caps.

- A. If these are desired cast on stitches enough to make 14 inches in width, when knitted. Knit plain for 12 inches if cap of double thickness is desired or 18 inches if treble. Bind off. If 12 by 14 inches fold once in each direction and sew the 7-inch edges together to form back of cap. If 18 by 14 inches make two 6-inch folds before folding in other direction. Thread ribbon in and out bottom to draw up to fit neck and to tie.

VI. Coats.

- A. The lesson on the coat is given in a later problem in this unit.

VII. Sleeping bags.

- A. Bag of heavy woolen material for cold weather, or lighter weight for cool weather. Made to close about the neck, usually with buttons.

VIII. General suggestions.

- A. Be sure that clothing is not tight enough to bind the body or restrict movements of the limbs or prevent circulation of air.
- B. Several thickness of light-weight garments are warmer than one garment of heavy material because they hold more layers of still air which is a poor heat conductor. They are also more easily adjusted to suit changes of weather.
- C. Avoid nonwashable clothing for infants.
- D. Launder new clothing before using it. (See Section IV, Unit 1, Lesson III, F.)

UNIT 2.—CHILDREN'S CLOTHING.

(See Bibliography.)

Lesson I: Introductory Lecture, Discussion, and Demonstration.

I. Use.

- A. To keep the body at normal temperature under all climatic conditions and to protect it from injury.

II. Types of garments.

A. Underclothing.

- 1. Undershirt or union suit.
- 2. Underdrawers or bloomers.
- 3. Underbody.
- 4. Petticoats.
- 5. Stockings.
- 6. Garters.

B. Outer garments.

- 1. Dress or suit.
- 2. Rompers.
- 3. Coats.
- 4. Caps and hats.
- 5. Shoes.
- 6. Leggings.
- 7. Overshoes.
- 8. Gloves.

III. Discussion of garments.

A. Knitted underwear

1. As the child grows older this usually changes from woolen mixtures to all cotton. Cotton is more absorbent and is warm if loosely woven.
2. All underwear except petticoats may be obtained in the knitted garments.
3. All underwear should be so adjusted that the weight and pull comes on the shoulder.
4. Round garters should not be used; if tight they cause poor circulation.
5. Socks should not be worn in any but summer weather.
6. Underwear of the very heavy type should never be put on children. It is better to have additional outer garments to be worn out of doors.
7. Use cast-off adult garments to cut over for children.

B. Drawers and petticoat or bloomers and underbody.

1. Materials suitable.

- a. Long cloth.
- b. Cambric.
- c. Nainsook, etc. (*See* Section I, Units 1 and 2, for discussion.)
- d. Flannel.

(1) May still be used for winter wear. Petticoats may be of the Gertrude type.

(2) Remember that several light-weight articles are better in cold weather than one heavy garment.

NOTE.—Many people prefer bloomers to petticoats, making them of materials to match the dresses, or occasionally of serge for winter wear.

2. Patterns.

a. Measurements for patterns.

(1) Petticoat—waist measure, length to knee.—

(2) Drawers and bloomers—waist measure, length from waist to knee, depth of seat, breadth of seat.

(3) Underbody—chest measure, waist measure.

3. Decoration.

a. (*See* Section I, Unit 1.)

b. Simplicity and daintiness are the two important ideas to be kept in mind when planning decorations.

C. Rompers and dresses.

1. Materials suitable—gingham, chambray, linen, batiste, lawn, serge, albatross, percale, poplin, Indian head, swiss, organdie, challis. (*See* Section II, Unit 3, Lesson I.)

NOTE.—Cut over adult garments for children whenever possible. *See* Suggestions for remaking garments, p. 101.

2. Patterns.

a. Measurements.

(1) Dress—chest measure, waist measure, length to knee.

(2) Rompers—combination of dress and bloomer measurements.

3. Decoration. (*See* Section I, Unit 1; Section II, Units 2 and 3.)

III. Discussion of garments—Continued.

C. Rompers and dresses—Continued.

4. Design.

- a. Appropriateness to occasion.
- b. Adaptability to weave and design of materials.
- c. Suitability to age of child.
- d. Simplicity and ease of laundering.

D. Coats.

- 1. Materials suitable—serge, shepherd's check, velvet, pongee, covert, cheviot, velour, piqué, etc.
- 2. Patterns, design, etc.—same as for dress.
- 3. Making. (See Section IV, Unit 3.)

E. Caps and hats. (See Section V.)

F. Shoes, overshoes, etc.

- 1. Discuss sensible standards for selection.
 - a. Comfort.
 - b. Freedom.
 - c. Quality, etc.

IV. Testing materials. (See Section II, Unit 3, Lesson I.)

V. Findings—buttons, bias binding, thread, patterns.

VI. Computations.

- A. Amount of materials.
- B. Amount of findings.
- C. Amount of trimmings.
- D. Cost of entire purchase.
- E. Comparison with ready-made clothing.
- F. Comparison with budget allowance.

HOME WORK.

VII. Taking measurements and testing patterns.

VIII. Purchasing materials, etc.

IX. Shrinking materials and preparing for cutting.

Lesson II: Demonstration and Classroom Practice.

NOTE.—The garments to be made in this problem are bloomers or drawers and a dress. To save time it may be best to cut, mark, and baste these garments in this lesson so that they may be fitted at home, leaving the two lessons following for finishing. For directions for preparing garments for fitting and for making alterations, see Sections I and II. Remember, when fitting, the children's garments must fit easily to allow for plenty of freedom of movement. Also allow plenty in length to be let down as the child grows. If one child could be brought to class for a demonstration fitting it would be a great help.

Lesson III.

I. Finishing bloomers or drawers.

A. Seams.

- 1. Stitched fell. (See Section I, Unit 1, Lesson II.)

B. Plait or gather fullness at top and bottom to fit bands or finish with casing, elastic, and hooks and eyes.

C. Set to band. (See Section I, Unit 2, Lesson IV.)

D. Finish with required number of buttons and buttonholes. (See Section I, Unit 2, Lesson III.)

NOTE.—If drawers are made, the top is finished with bands, after the plackets have been made. Use bound and faced placket, Section I, Unit 2, Lesson IV. See setting of ruffles, tucking, etc., in the same unit.

II. Finishing dress.

A. Seam finishes. (See Section II, Unit 3, Lesson IV.)

*Lesson IV.***I. Finish of dress.**

- A. Plackets. (*See Section II, Unit 3, Lesson V.*)
- B. Hem closing. (*See Section II, Unit 2, Lesson IV.*)
- C. Waist-line finish for dress having division. (*See Section II, Unit 3, Lesson VI.*)
 1. Gather bottom of waist and gather or plait top of skirt and set both to waist band.
 2. Baste and stitch facing to right side.
 3. For one-piece dress mark waist line at under arms, and attach loops through which straight belt may be passed.

D. Hem.

1. Plain hem best. (*See Section I, Unit 1, Lesson III.*)

E. Sleeves. (*See Section II, Unit 2, Lesson III.*)**F. Cuffs and collar finishes.** (*See Section II, Unit 2, Lessons IV and V.*)**G. Belt.**

1. Cut straight lengthwise piece of material length of belt plus seams and lap by twice desired width.
2. Fold with right side inside.
3. Stitch one-fourth inch from edge, open seam.
4. Turn right side out and fold so seam comes in middle of wrong side.
5. Turn in raw edges at ends and stitch around belt.
6. Finish with buttons and buttonholes.

UNIT 3.—BOY'S SUIT (WOOL).

NOTE.—This garment may be made from adult's suit, as a problem in conservation. *See Suggestions and outline for a group of lessons on conservation of clothing, p. 100.*

(*See Bibliography.*)

*Lesson I: Introductory Lecture, Discussion, and Demonstration.***I. Use of garment.**

- A. Warmth, protection.

II. Types.

- A. Norfolk jacket or coat.
- B. Knickerbockers or trousers.

III. Materials.

- A. Types.
Serge, tweed, worsted, homespun.
- B. Durability (relative).
- C. Cost (compared with allowance).

IV. Findings.

- A. Canvas, tape, thread, buttons, lining.

V. Ready-made v. made at home.

- A. Suggest conservation by making from father's suit which is no longer fit for service for him.

VI. Measurements.

- A. Coat or jacket.
 1. Breast—across breast, tape well up under arm, to center back.
 2. Length—neck to waist.
- B. Trousers.
 1. Waist line—around waist.
 2. Across front.

VI. Measurements—Continued.

B. Trousers—Continued.

3. Across seat.

4. Length.

a. Center front.

(1) Waist line to crotch.

(2) Crotch to knee.

b. Center back.

(1) Waist line to crotch.

(2) Crotch to knee.

c. Side line.

(1) Waist line to knee.

VII. Computation—quantities and costs.

Selection of pattern.

VIII. Buying pattern and material.

IX. Sponging material. (See Section III, Unit 1, Lesson I.)

Shrinking canvas and tape.

1. Place in water for some time; drain but do not wring; press until dry.

NOTE.—Material, tape and canvas should be prepared at home previous to this lesson.

Lesson II: Demonstration and Classroom Practice.

I. Cutting jacket and trousers.

A. Test pattern according to measurements taken.

B. Alter pattern.

C. Place pattern economically, pin to cloth or weight it.

D. Cut cloth.

E. Cut canvas like facing for jacket. Do not cut lining until after fitting.

II. Basting jacket.

A. Mark seams (tailor tacking).

B. Mark place for pockets, all notches, plaits, center back, center front, revers, lines, etc., with colored thread.

C. Baste plaits in jacket and parts of jacket together.

D. Baste tape to neck and armhole to prevent stretching.

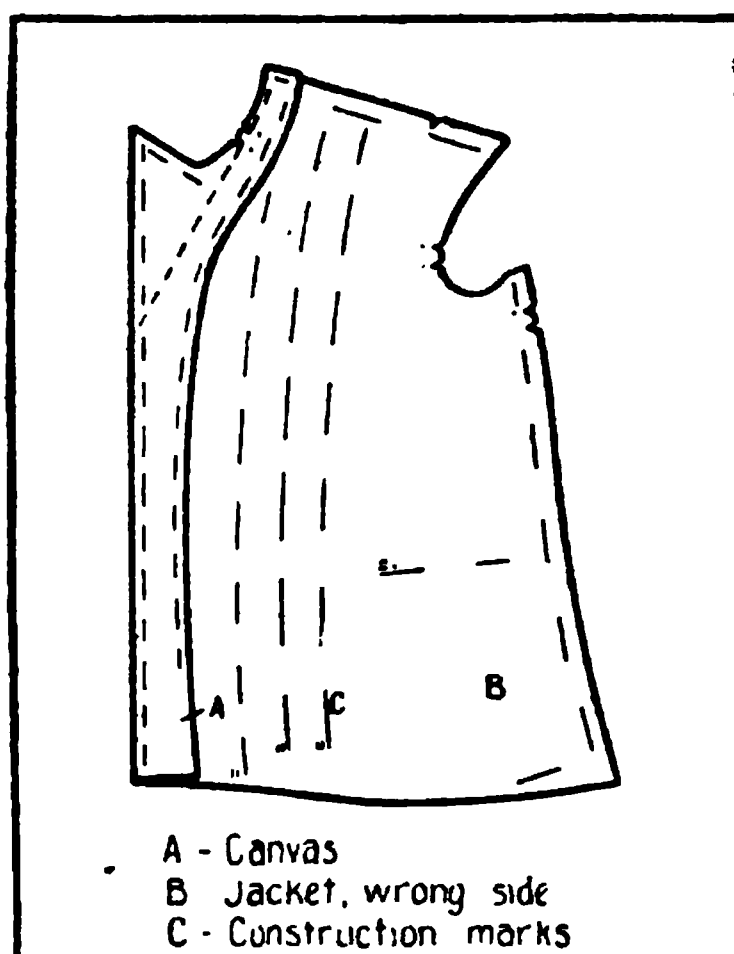


FIG. 36.—Basting canvas in jacket.

III. Basting trousers.

A. Same as above.

B. Draw lower edge of knickers up with strong thread for fitting.

IV. Home work.

A. Baste and fit suit.

*Lesson III.***I. Making jacket.**

A. Placing canvas (fig. 36).

1. Rip shoulder and underarm seam.

2. Baste canvas in fronts of coat. Baste through turn of revers.

3. Pad revers (fig. 37).

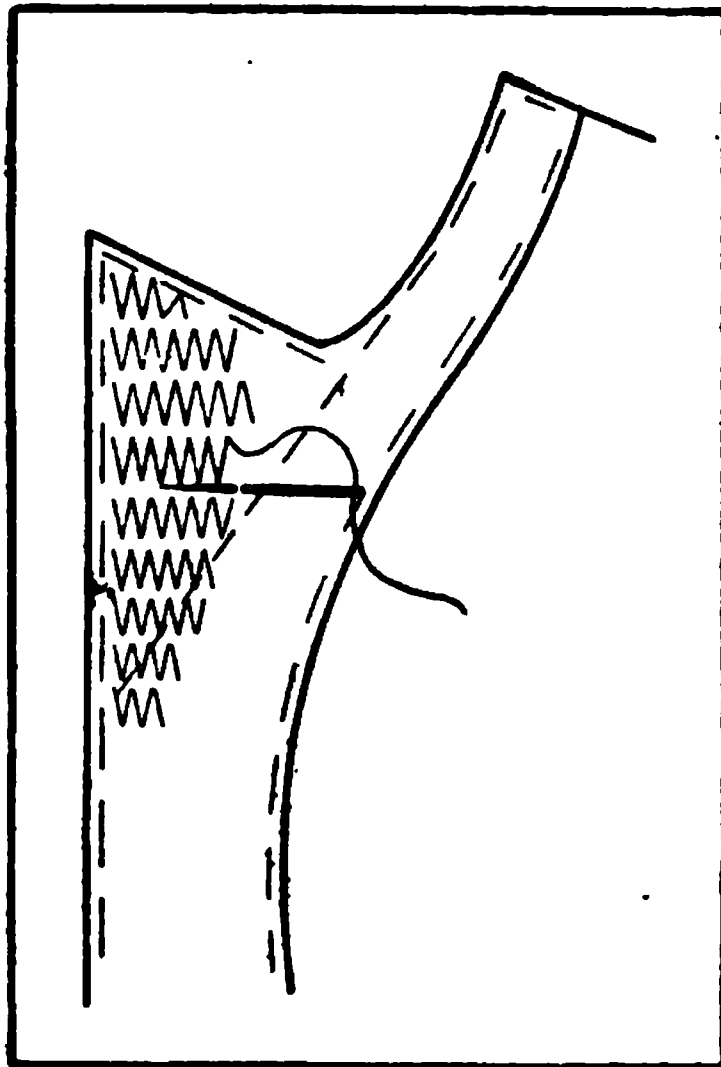


FIG. 37.—Padding revers.

a. Use padding stitch or diagonal basting. (*See Bibliography—stitches.*)

Push canvas slightly toward the fold of the revers, making canvas slightly fuller than the cloth.

4. Baste strip of cambric to canvas on line for buttonholes and buttons.

5. Dampen and press.

6. Cut edge of canvas away three-eighths inch from edge of coat.

7. Baste facing to place; stitch; open seam and dampen well and press it; go carefully around corner of revers; trim seam edge of coat one-eighth inch less than facing edge.

8. Baste stay tape to canvas so that it extends just to seam of coat and facing; hem to canvas, and to seam of coat with a running stitch; turn facing over and baste carefully right on edge; also on inside edge to canvas.

Also baste stay tape to turning line of revers. Press rever back on fold, dampen well before pressing.

9. Baste fronts of coat to place; stitch and press shoulder and underarm seam.

10. Baste 1 inch bias strip of canvas to lower edge of coat (on finishing line); turn edge of coat on this and catch-stitch (Section I, unit 1), to canvas; dampen well and press.

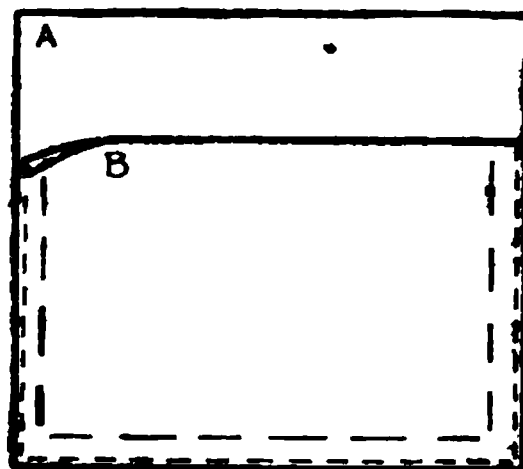
II. Home work.

Complete work unfinished in class.

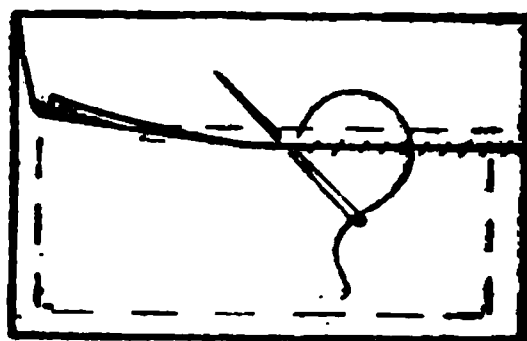
Lesson IV.

I. Making jacket.

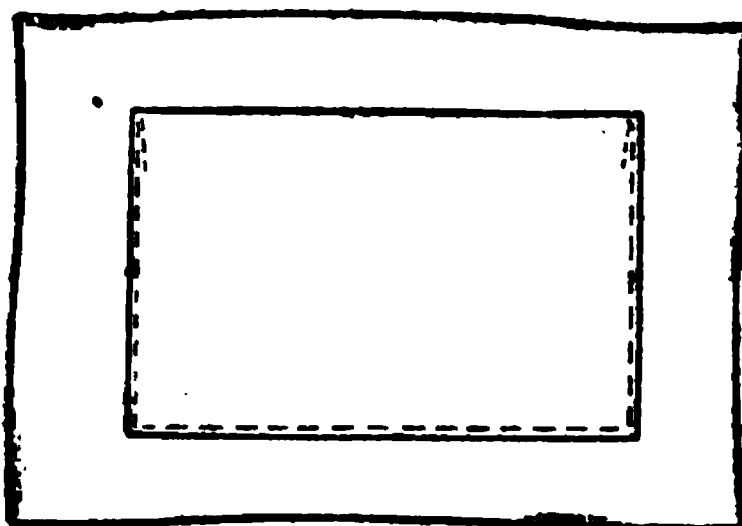
A. Pocket (fig. 38).



A - Cloth.
B - Lining



C - Hemming top to lining.



D - Setting pocket on coat.

FIG. 38. — Making pocket for coat. Patch pocket.

1. Baste and stitch pocket and lining (except top); turn to right side; dampen and press.
2. Turn top of cloth over as a hem, baste, dampen, press, and stitch.
3. A flap may be set on top of pocket. Make this same as pocket.
4. Set pocket on coat, baste, press, stitch to place; secure ends of pocket by turning work and going back a few stitches; stay cloth by placing a piece of tape at the corners before stitching.

B. Collar (fig. 39).

1. Cut collar and canvas like fitted pattern; dampen and stretch the lower and upper edges of both canvas and collar, press and fold canvas on line marked for stand; open, lay cloth on this and baste through stand line. Pad the lower part of the collar, stitches running around the collar; pad only as far as line marked for stand and to within three-eighths inch of edge. Machine stitch several rows across collar below stand line; dampen again and press well.

I. Making jacket—Continued.**B. Collar—Continued.**

2. Turn in edge of collar at neck line; baste and place on neck line of coat; hem collar to coat (small stitches) as far as notch at revers.
3. Baste facing to collar; stitch seam, dampen, press open and tape same as revers; turn facing over on to top of collar, and turn in edge of revers and edge of collar, so they just meet; slip stitch closely; dampen and press well, both revers and collar.

II. Home work.

Finish work on pockets and collar.

*Lesson V.***I. Sleeves.**

- A. Stitch sleeves; dampen, press seam open; clip at elbow so seam will spring.
- B. Finish bottom of sleeve like bottom of coat.

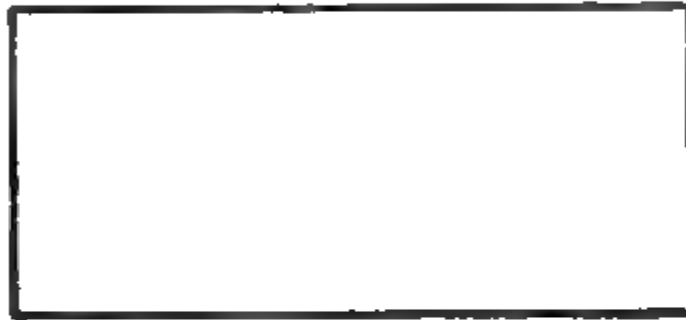


FIG. 32.—Padding under part of collar.

- C. Baste sleeves in coat; try on to see that they are correct. Stitch, press whole garment well.

II. Lining.

- A. Lining of coat and sleeve cut from altered pattern. Allow plait at neck in back. Fronts cut 2 inches narrower than front of coat on front edge so as to extend only from 1 to 2 inches over facing.
- B. Baste back lining in, laying fold at neck, to allow for stretch when putting on; tack lining at shoulder seams and under arms.
- C. Place front linings, turn in edges, baste, and slip-stitch to facing; hem to under-arm and shoulder.
- D. Turn in edge at bottom, hem to edge at front; at back, turn edge back on lining and catch-stitch edge invisibly.

III. Home work.

All unfinished work.

*Lesson VI***I. Buttonholes and Buttons.**

- A. Same as Section I, Unit 1, Lesson III, except that a small circular piece is cut from the outer end of the buttonhole, and a cord made of the buttonhole twist is laid along the edge, over which the buttonhole is worked; this makes a strong buttonhole.

II. Finish jacket

- A. Remainder of time to be spent on finish of jacket, answering questions, etc

III. Home work

Complete jacket.

*Lesson VII.***I. Making trousers.****A. Placing pockets (fig. 40).****1. Slash or set in pockets.**

- a. Cut stout piece of muslin or other firm material for pocket $1\frac{1}{2}$ inches wider than desired pocket opening by twice desired depth of pocket plus 1 inch.
- b. Baste on the wrong side of the trousers, one end touching colored marking for pocket on its lower side.

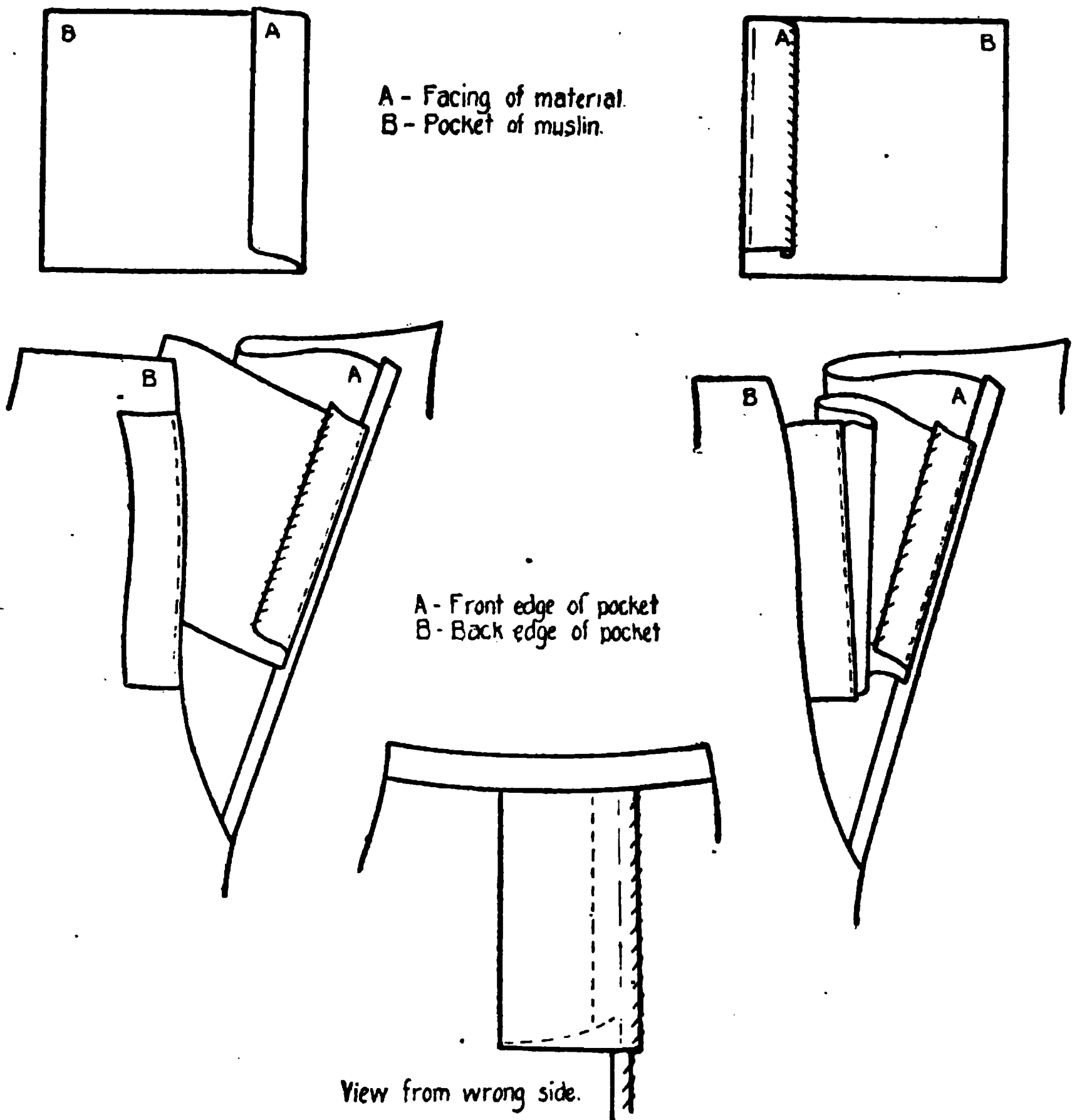


FIG. 40.—Set-in side pocket.

- c. Cut facing of same material of which garment is made $1\frac{1}{2}$ inches wider than opening by 5 inches long.
- d. Baste right side of facing to right side of garment so colored marking lies under center of facing.
- e. Continue as for bound buttonhole. (See Section II, Unit 2, Lesson IV, Steps (5) to (10), inclusive.) Press as in coat.
- f. Baste edges on line of previous stitching. Turn to right side and stitch along lower edge of opening one-sixteenth inch below seam. Stitch through trousers, facing, and muslin.

I. Making trousers—Continued.**A. Placing pockets—Continued.****1. Slash or set in pockets—Continued.**

- g. Turn back to wrong side and fold upper portion of facing down one-eighth inch beyond line on which it is basted.
- h. Fold lower end of pocket up over this with end extending 1 inch above pocket opening. Baste around ends and upper edge of pocket opening.
- i. Turn to right side, stitch ends and upper edge of opening one-sixteenth inch from former seam.
- j. Catch stitch edge of facing to back of pocket.
- k. Stitch sides of pocket together and fasten at ends by turning and stitching back for a few stitches.
- l. Turn raw edges together and stitch or run by hand.
- m. Trim upper extension of muslin to one-fourth inch and overcast.
- n. Press finished pocket.

2. Side pocket.

- a. Cut square for pocket, from muslin, $1\frac{1}{2}$ inches longer than depth of pocket on side seam.
- b. Cut bias facing of material like trousers, the length of the opening by 2 inches wide.
- c. Sew facing to muslin pocket, right sides together, plain seam.
- d. Turn facing back on pocket allowing facing to extend one-eighth inch beyond seam. Baste on seam line and turn and hem other edge of facing flat to pocket. Press.
- e. Turn and baste front edge of trousers where pocket is to be attached. Press. Place faced edge of pocket (facing side up) about one-fourth inch back of the folded edge of the trousers. Baste to place.
- f. Cut another bias facing as before and baste to back edge of pocket with facing extending away from opening. Place with right sides together. Stitch plain seam.
- g. Bring opposite edge of pocket over and baste flat over edges of seam of facing and pocket opening.
- h. Fold facing back on pocket, turn under edge, and stitch flat to pocket. Press.
- i. Stitch across bottom of pocket and fasten ends by stitching back.
- j. Top of pocket is caught in under band when finishing top of trousers.
- k. Make last outside stitching on front edge of pocket in one with final stitching of welt seam which finishes outside seam on leg of trousers or knickers.

II. Home work.

Finish making pockets.

*Lesson VIII.***I. Making fly (fig. 41-a).****A. Finishing left-hand side or upper edge of fly.**

- 1. Cut facing of material to fit fly.
- 2. Place right sides together, baste and stitch plain seam. Press.
- 3. Fold facing back to wrong side so seam falls just back of folded edge. Baste close to folded edge. Press and stitch $\frac{1}{4}$ inch from edge.
- 4. Baste facing flat to garment at inner edge.

I. Making fly—Continued.

B. Making extra flap for fly.

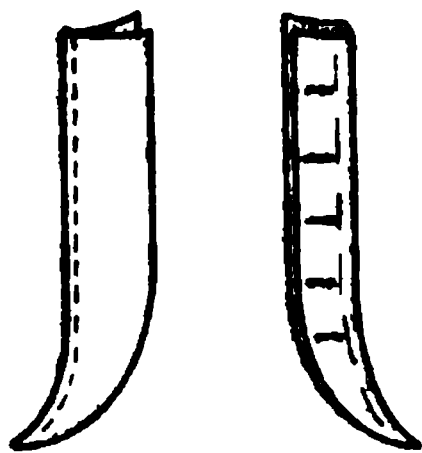
1. Cut two more pieces the shape of facing, one of material like suit and the other of lining material.
2. Place right sides together, baste and stitch plain seam. Press open, fold back on seam line, baste and press.
3. Work buttonholes in the fly. (See Section I, Unit 1, Lesson III.)

C. Setting flap to upper portion of fly.

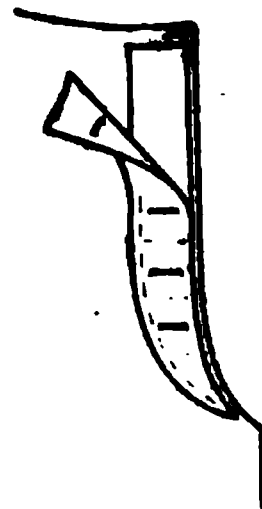
1. Set flap with right side of flap to wrong side of opening so that outer portion extends from $\frac{1}{4}$ to $\frac{1}{2}$ inch beyond edge of flap. Baste.
2. Stitch $\frac{1}{4}$ inch inside back edge of flap and across bottom through flap and outside. Overcast raw edges.



A- Facing upper or left hand edge of fly opening



B- Facing extra fly piece and placing buttonholes



C- Setting extra fly portion to upper edge

FIG. 41a—Making fly.

3. Backstitch flap to facing of outer portion midway between the buttonholes.

II. Finishing lower or right-hand edge of fly with extension for buttons (fig. 41-b).

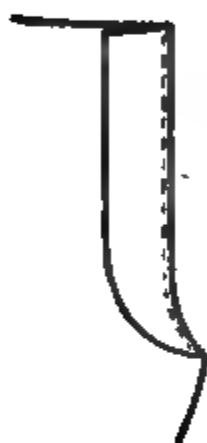
- A. Cut two more pieces the shape of the facing, one of material and one of lining.
- B. Join piece like garment to lower edge, notches meeting, and right sides together; stitch, open seams flat, and press.
- C. Stitch lining to extension, right sides together.
- D. Turn lining back on extension and run to seam line by hand. Overcast edge.
- E. Stitch $\frac{1}{4}$ inch from edge and about same distance beyond seam on garment.
- F. Place buttons (flat) to correspond with buttonholes.

III. Finish when fly is not desired

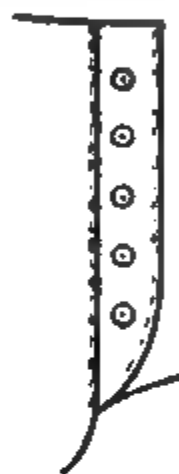
- A. Face right-hand side of opening.
- B. Catch-stitch facing to wrong side and press flat.
- C. Set line of extension on left side of opening slipping edge of opening between extension and lining, the raw edges of which have previously been turned under.

IV. Finishing seams.

- A. Use welt seams (fig. 28) or plain seams with edges pressed open and overcast. (See Section III, Unit 1, Lesson IV.)
 1. In either case, baste right sides together and stitch on finished line.
 2. If plain seam is used, a piece of tape should be stitched to the center front and back seams to keep the bias from stretching; the double stitching in the welt seams serves this purpose.
 3. In making the second stitching of welt seams be sure to keep



First stitching of extension
on right hand side of fly opening.



Finished view of extension.

Placing facing over extension

FIG. 41b—Extension for buttons.

it in line with the final outside stitching on side pockets and fly.

V. Home work.

Finishing seams.

Lesson IX.**I. Finish at bottom of trousers.**

- A. Turn hem in lower edge
- B. Sew Prussian binding (shrink) to upper edge of hem, using blind hemming. (See Section III, Unit 1, Lesson VII.)

II. Finish at bottom of knickerbockers.

- A. Cut band to meet around leg, plus extra for extension under lap.
- B. Set band to lower edge which has been gathered. (See Section I, Unit 2, Lesson IV.)
- C. Stitch both edges of band.
- D. Finish with button and buttonhole or buckle and strap

III. Finish at waist line.

- A. Stitch darts; cut, open, and press flat.
- B. Place right side of waistband to right side of trousers, baste and stitch plain seam; open and press.
- C. Fold band to wrong side with seam $\frac{1}{2}$ inch inside of folded edge; baste, press.
- D. Turn under raw edge; baste, press; stitch to garment.
- E. Set straps on outside to hold belt, or work buttonholes in waistband if trousers button to underwaist or shoulder straps
- F. Finish top of front, closing with button and buttonhole in band.

Section V—Millinery. (*See Bibliography.*)

SUGGESTIONS FOR USE OF THE LESSONS.

The material included in the section on millinery does not fall so readily into groups as the subject matter in the preceding sections. For this reason, the division into units which is suggested is more or less arbitrary and may be changed at the discretion of the teacher to fit the needs of the students. Unit 1, as written, contains 12 lessons. Where so extended a course is not desired it is suggested that the students omit either lessons 4, 5, 6 on making soft frames, or lessons 7, 8, 9 on wire frames, according to the type of hat in which they are interested. This will shorten the course to 9 lessons. Where a part of the class wishes instruction on one type of hat and others prefer the other, the teacher could give separate instruction to each group on its problem, so that both processes could be carried on simultaneously and the unit completed in eight lessons.

Students desiring to enter unit 2 who have not had unit 1 may provide themselves with a commercial hat frame to be covered and trimmed. For such students a new unit might be formed, beginning with lessons 10, 11, unit 1, on covering hat frames, and continuing with unit 2. This new unit would contain 10 lessons, or might be shortened to eight by omitting the last two lessons on care and renovation of hats.

It should be noted that the introductory lecture and discussion at the beginning of unit 1 contains all the subject matter necessary for the entire section. While much of this belongs in the first lesson and should be given to the class at that time an extended discussion of some of the points may be left until the special need for the information arises, later in the lessons of unit 1 or of unit 2.

The purpose of this section is—

- I. To teach women the principles of construction involved in millinery.
 - A. Making patterns for hats.
 - B. Crinoline or soft frames.
 - C. Wire frames.
 - D. Covering frames.
 1. Fabric.
 2. Straw.
 - E. Making trimmings.
 - F. Finishing.
- II. Appreciation of color, line, and form.
- III. Knowledge upon which to base choice of vocation.
- IV. Conservation.
 - A. Making one's own new hats.
 - B. Care, renovation, and remodeling of old hats, trimmings, etc.

UNIT 1.—THE MAKING OF A HAT FRAME.

Lesson I: Introductory Lecture, Discussion, and Demonstration.

I. Use of hats.

A. Business or travel.

1. Small, close fitting, simple in line, but smart looking, is most practical type.
2. Bright or vivid colors to be avoided for this purpose.
3. Hat and ornament should be of a good, serviceable material, rather than a cheap one, which will look shabby after a few wearings.

B. Sports.

1. Sport hats should fit the head snugly, so they will stay in place well. They should have a brim for summer wear, but preferably not for winter; they should be soft so they will not easily lose their shape.

I. Use of hats—Continued.**B. Sports—Continued.**

2. Sport hats may be bright in color, and should be extremely smart in style and decoration.
3. Hats of this type need not be expensive. They may frequently be made of the material of a sport skirt or suit.

C. Dressy wear.

1. Widest range of choice in this type and opportunity to express one's own individuality. The hat should be of such color and material as will harmonize with the costume with which it is to be worn. Much thought must be given to its design, as it may complete or mar the harmony of the whole costume.
2. Avoid extremes in styles.

II. Types.**A. Children's hats (never elaborate).**

1. Winter.
 2. Spring and fall.
 3. Summer.
- } Handmade, shop, home.

B. Women's and girls'.

1. Winter.
 2. Spring and fall.
 3. Summer.
- } Factory made, (1) hand-covered frame, (2) blocked.

III. Materials.**A. Kinds.**

1. Straw—Milan, Milan hemp, hemp, Panama, Leghorn, Tuscan, chip, lisere, etc.
2. Horsehair braid.
3. Textile fabrics—Velvet, velour, satin, chiffon, georgette crêpe, chenille, felt, silk, tulle, maline, lace and net, linen, etc.
4. Fur—Beaver, squirrel, mole, seal, etc.

B. Relative durability where comparison is possible.**C. Relative cost.****D. Appropriateness of materials to occasion, age, and type of wearer.****IV. Choice of design.****A. Suitability to occasion. (See Unit V, Lesson I.)****B. Suitability to wearer.**

1. Age.
2. Complexion.
3. Shape of head and face.
4. Mode of dressing the hair.

C. Elements of design.

1. Simplicity and beauty of line, form, and decoration.
2. Color.
3. Harmony of materials, color, line, and form.

V. Decoration.**A. Types.****1. Handmade.**

- a. Flowers and fruits of ribbon, silk, satin, straw, braid, etc.; wool crochet and embroidery of wool, silk, floss or metallic threads.
- b. Ribbon bows, rosettes, bands, plaitings, shirrings, cockades, etc.

2. Factory made.

- a. Silk and cotton flowers.
- b. Berries and fruits.

V. Decoration—Continued.

A. Types—Continued.

2. Factory made—Continued.

c. Bead, metal, leather and straw ornaments.

d. Feathers and feather ornaments, quills, wings, breasts, plumes, aigrettes, pompons, etc.

e. Fur bands and ornaments.

3. Discussion. (See III, B, C, D.)

VI. Shapes.

A. Factory, shop, or home work.

B. Materials used.

1. Buckram.

2. Cape net.

3. Rice net.

4. Crinoline.

5. Willow.

6. Wire.

VII. Equipment to be provided.

A. Milliner's combination pincers.

Scissors or small shears.

Pins, small, sharp.

Milliner's needles, 7 to 9, 1 package.

Needles, 7 to 9, 1 package.

2 spools milliner's thread, 1 white, 1 black.

Silk or cotton as needed to match materials.

1 roll medium weight brass wire.

1 spool tin wire.

1 tape measure.

1 pencil (yellow crayola).

Thimble.

(Materials needed for certain lessons will be specified from time to time. These materials may be already on hand from the work in dressmaking and such extra ones as are necessary may be supplied as the need arises.)

VIII. Computations.

A. Amount of material.

B. Amount of trimming.

C. Findings.

D. Cost of above.

E. Comparison with amount allowed in budget.

IX. Factory and shop made versus homemade millinery.

A. For suggestion see Section II, Unit 2, Lesson I.

Lesson II: Demonstration and Classroom Practice.

NOTE.—Unless otherwise indicated, home work will consist of completing the work up to the point for the next demonstration.

I. Cutting patterns from paper and frame materials.

A. Measurements.

1. Head size—measure with tape measure around head where hat should set, taking close but not tight measurement; add $\frac{1}{2}$ " inch to this for amount taken up by covering, lining, etc.

2. Diameter from front to back.

3. Diameter from left to right.

4. Height of side crown, front, back, left, right.

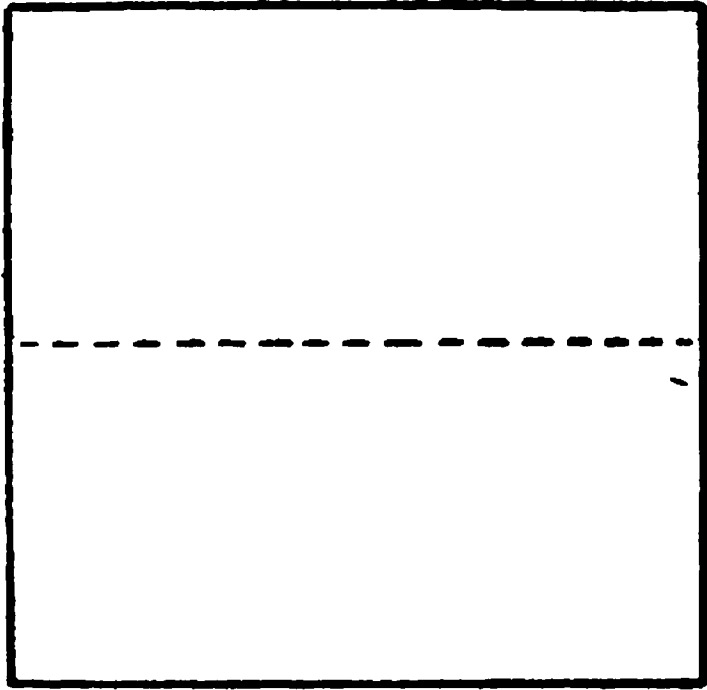
5. Diameter of tip of crown as in brim.

6. Distance around edge of tip.

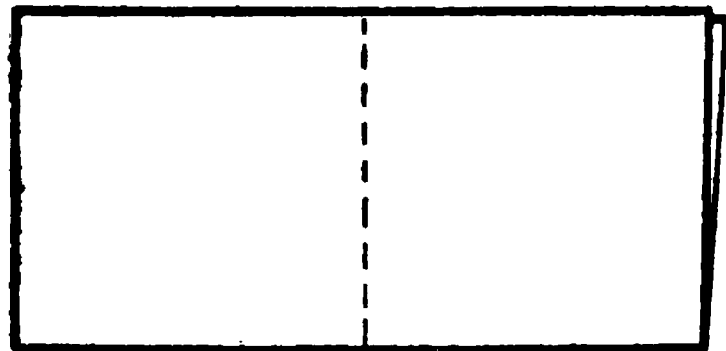
I. Cutting patterns from paper and frame materials—Continued.

B. Brim—large flat sheets of paper are necessary. (Newspaper will answer this purpose.)

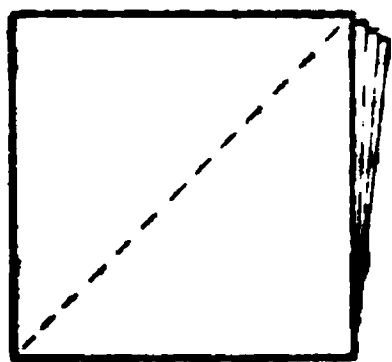
1. Cut square a little larger than longest diameter of brim desired.
2. Fold four times (fig. 42): first and second fold on line parallel with edge to make square; third fold on diagonal; fourth fold on radius.



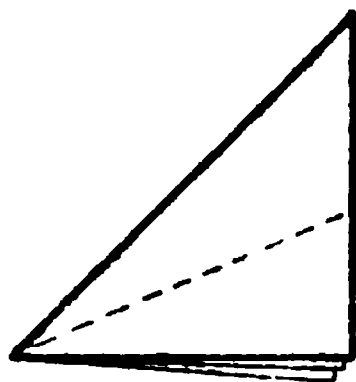
A - Square for cutting pattern.



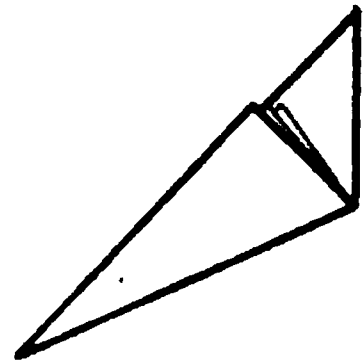
B - After first fold.



C - After second fold



D After third fold



E - After fourth fold.

FIG. 42.—Method of folding paper for hat-frame pattern.

3. From the point measure out one-half longest radius along each edge and midway (fig. 43) between and connect dots with curved line.

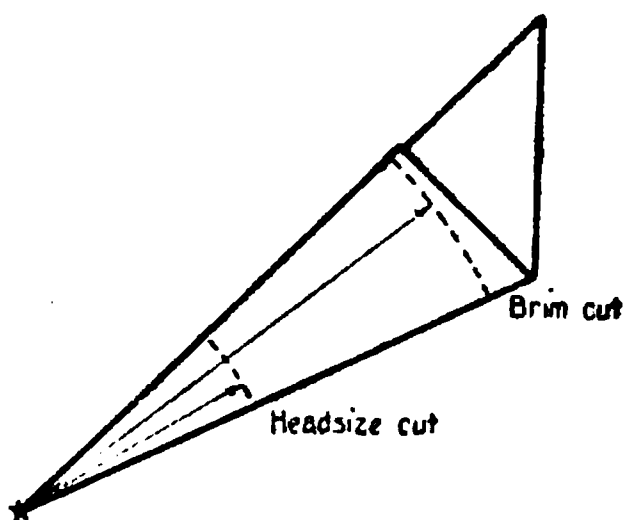


FIG. 43.—Method of measuring for brim and head size.

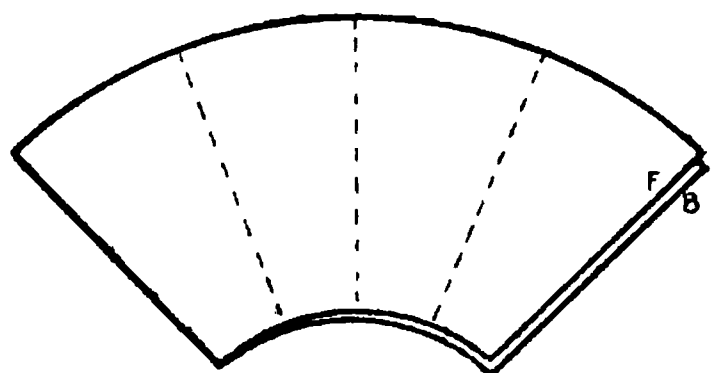


FIG. 44.—Marking front and back spokes.

4. Head size—measure in same way as above one-half shortest head size diameter; cut pattern on both curved lines.

I. Cutting patterns from paper and frame materials—Continued.

B. Brim—large flat sheets of paper are necessary—Continued.

5. Open last two folds made and mark folded edges (fig. 44) which now lie together, one front and the other back. This will give the pattern for a perfectly flat sailor, but hats should usually be longer on one diameter than the other, and the head size should be oval to fit the head.
6. To lengthen head size or brim.
 - a. Have pattern folded as above.
 - b. Subtract the shortest head-size diameter from the longest and take one-half this remainder.
 - c. Measure down the distance from head size on front and back fold.
 - d. On midway spoke, measure one-half the distance just used.
 - e. Connect these dots with a curved line which tapers off to nothing at the fold (fig. 45).

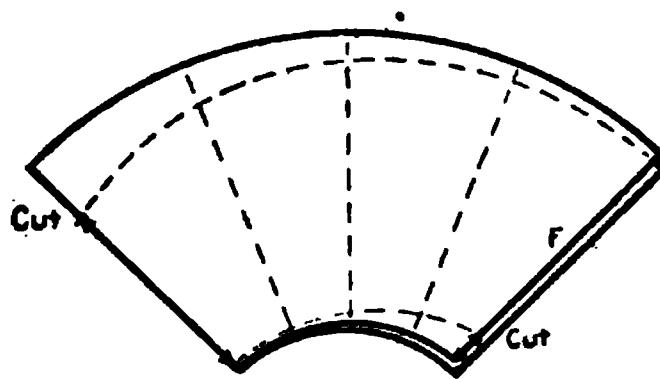


FIG. 45.—Method of changing round brim and head size to ovals.

- f. Cut on this line.
- g. Elongations or shortening on the brim are secured in the same way, measuring from the head size before it is trimmed away. If elongations on the sides are desired, reverse the order of measuring and cutting on the folds.
7. Variations (fig. 46).

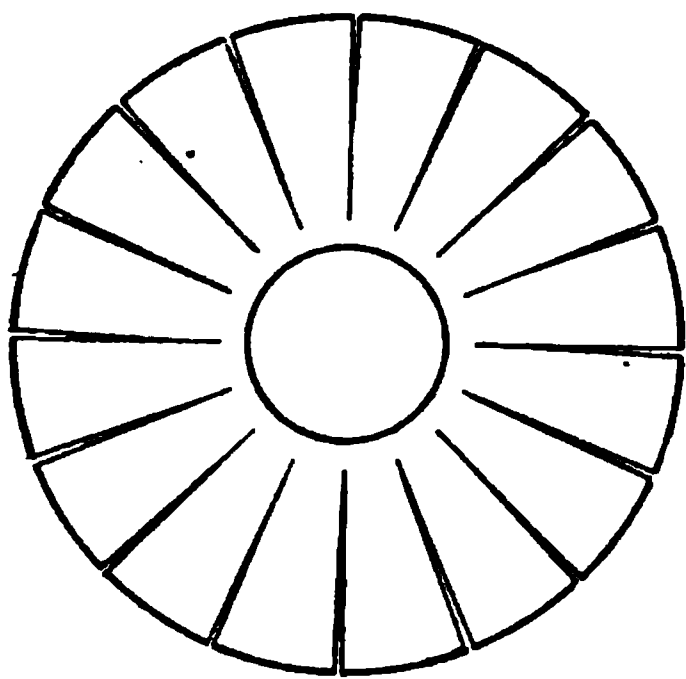
Many variations of brim can be made from this pattern by slashing and lapping the parts, slashing in to the point where the droop or roll should begin, making as many or as few slashes as are necessary to produce the desired effect, cutting always on the fold and then midway between for each additional cut. Experiment with paper to get shape desired. Some patterns will lie flat if cut entirely through on the back spoke, and may then be cut in one solid piece, from frame material, allowing one-half inch on one side of back for seam. When cutting from frame material, allow 1 inch inside of head-size to slash and bend up for crown fastening.
8. Home work.

Experiment with shapes until one which is becoming is secured.

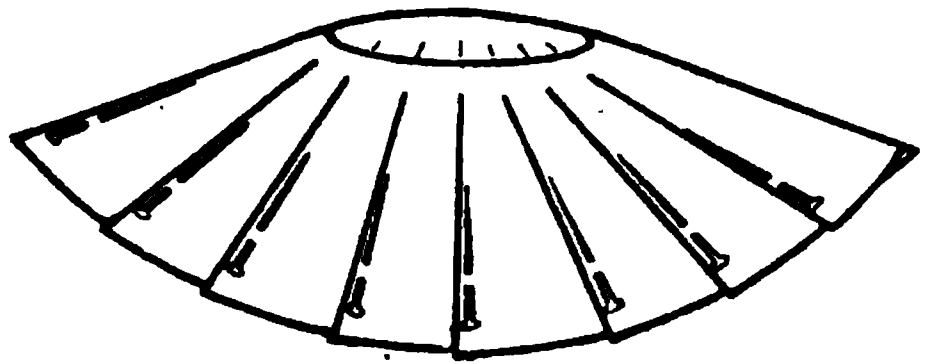
Lesson III.

A. Side crown.

1. Straight.
 - a. Cut straight piece of material of necessary length and width plus $\frac{1}{2}$ inch for seams.
2. Slanting (fig. 47).
 - a. Cut straight piece as above.
 - b. Measure to get exact head size.
 - c. Fold in quarters or eighths as desired, and slash on folds to within $\frac{1}{4}$ inch of lower edge.
 - d. Lap $\frac{1}{4}$ inch and pin.
 - e. Open flat and cut from frame material.



A - Slashing brim.



B - Lapping brim.

FIG. 46.—Method of changing flat brim to drooping brim.

B. Crown top.

1. Cut circle and get ellipse in manner described.
2. Lay over crown rim and plait in fullness and tack to side crown.

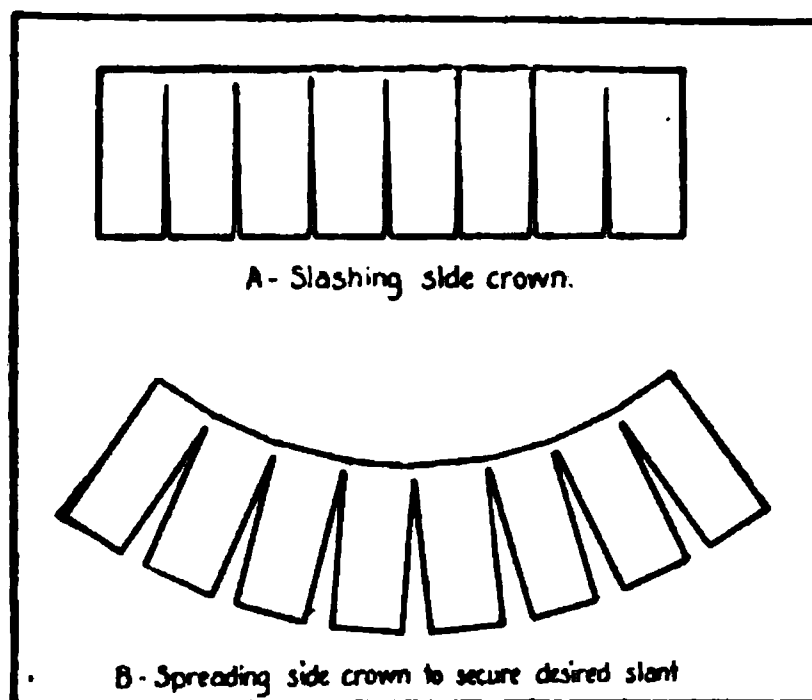


FIG. 47.—Method of making slanting side crown.

C. Tam crown.

1. Make two ovals of same size and cut a hole for head size from lower one; fasten together with seam.

D. Home work.

Practice making crowns to harmonize with brims of last lesson.

Lesson IV.

[Necessary materials, sheets of buckram, willow or other frame material, and one roll of brace wire.]

I. Method of wiring and preparing frame (of buckram, or other stiff material) for covering.

A. Trim edges so they are in an even line.

B. Wire edge of brim and head size of brim and base of crown.

1. Cut brace wire length needed plus 2 inches for lap.
2. By passing wire over thumb of right hand, work it to the exact shape of part to be wired. Never depend on frame to hold wire to position.

I. Method of wiring and preparing frame—Continued.

B. Wire edge of brim and head size of brim and base of crown—Continued.

3. When wiring edge always hold wire just to one side of edge, and take stitch the depth of wire from edge. Let wire for head size lie in crease formed by clipped edge; mark this crease with pencil before placing wire, to keep it straight.
4. Sew with lock stitch (fig. 48). Demonstrate

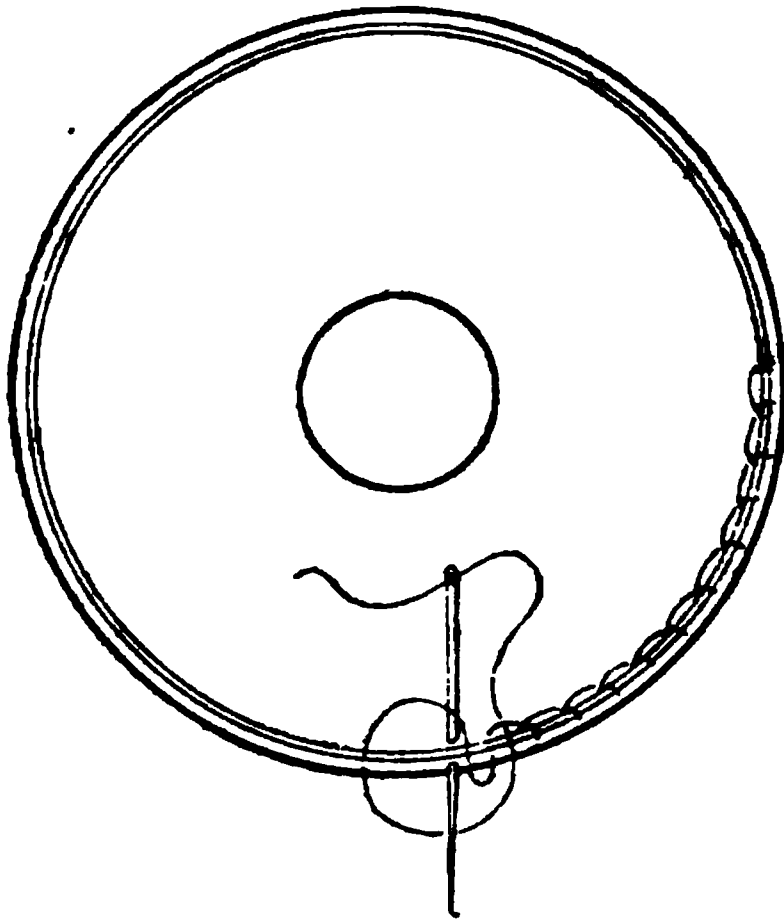


FIG. 48.—Lock or wire stitch.

- a. Knot thread.
 - b. Fasten thread by drawing needle through from back to front two or three times.
 - c. Take stitch $\frac{1}{2}$ inch ahead working from back to front, and pull thread through from the back, leaving small loop.
 - d. Pass needle through this loop from back to front, and pull tight, locking the stitch.
 - e. To fasten, take two or three stitches over each other.
- C. Place bias strip of crinoline around head size to which the extra allowance left inside may be turned up and tacked.
- D. Bind edge of brim, edge of upright at head size, and base of crown, with bias strips of crinoline. Use true bias cut 2 inches wide. Stretch this binding as much as possible while sewing it to place. Sew with long basting stitches $\frac{1}{2}$ inch apart.

Lesson V.

[Necessary materials, 1 yard crinoline; crinoline frame or other soft frame material.]

A. Brim.

1. Cut a true bias strip of crinoline the length of the head size, plus a generous seam, by about three times the width desired for the brim.
2. Make lengthwise fold and sew wire around head size. Slash and turn up crinoline for upright.
3. Stretch edge to give desired roll or turn. Handle carefully.
4. Wire edge.

B. Side crown.

1. Cut bias twice height desired, by length plus seam. Make seam.
2. Make lengthwise fold. Wire at base.
3. Make crown tip and connect as before. Good foundations for children's hats.

*Lesson VI.***I. Altering commercial shapes.**

- A. Purchase shape as nearly as possible like the one desired, or which according to work of previous lessons can be altered to give desired shape.
- B. Remove wires where alterations need to be made.
 1. Trim edge to desired line.
 2. Clip and lap edge to secure desired shape.
 3. Cut crown at base to lower or raise (use crinoline to raise).
 4. Soft crown tips may be inserted in place of hard, etc.
 5. Cut and lap crown to decrease size, or to make shape more elliptical (fig. 49).

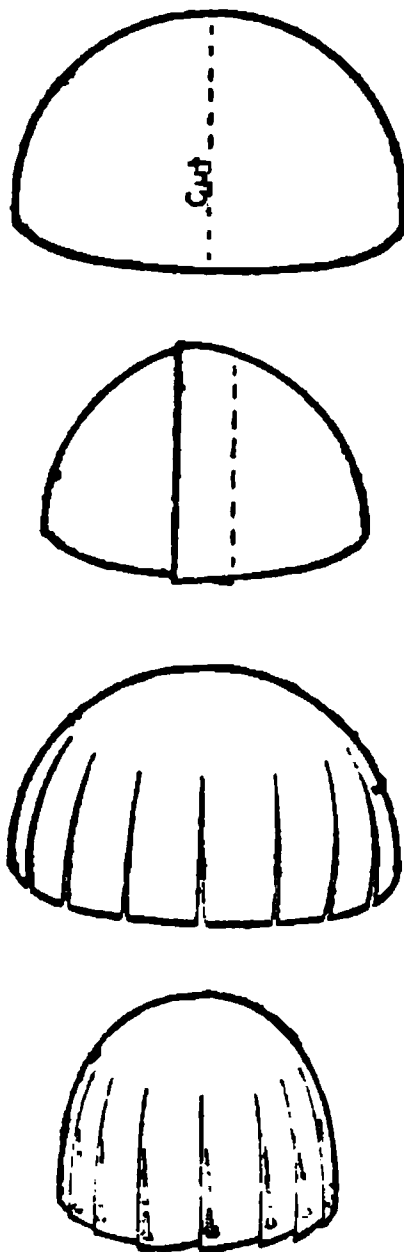


FIG. 49.—Methods of altering crown.

- C. Replace wires and rebind edge.

*Lesson VII.***I. Wire frames. (Necessary materials, brace wire, tie wire, and pincers.)**

- A. Open coil of brace wire; hold coil in left hand; unfasten; let it loosen gradually in the hand; pass over arm and knock until it forms an even spiral on arm.
- B. To cut.
 1. Place wire firmly and squarely between jaws of clippers and press straight down with no sawing or pulling motion.
- C. To straighten.
 1. Pass wire under outstretched thumb of right hand, working in the coil until the wire is perfectly straight or of the shape desired.
- D. To tie wire (fig. 50).
 1. Lap ends about 2 inches and wrap on small piece of tie wire tightly about 3 times around the end and fasten. Always let laps of tie wire lie one beside the other.

I. Wiring frames—Continued.

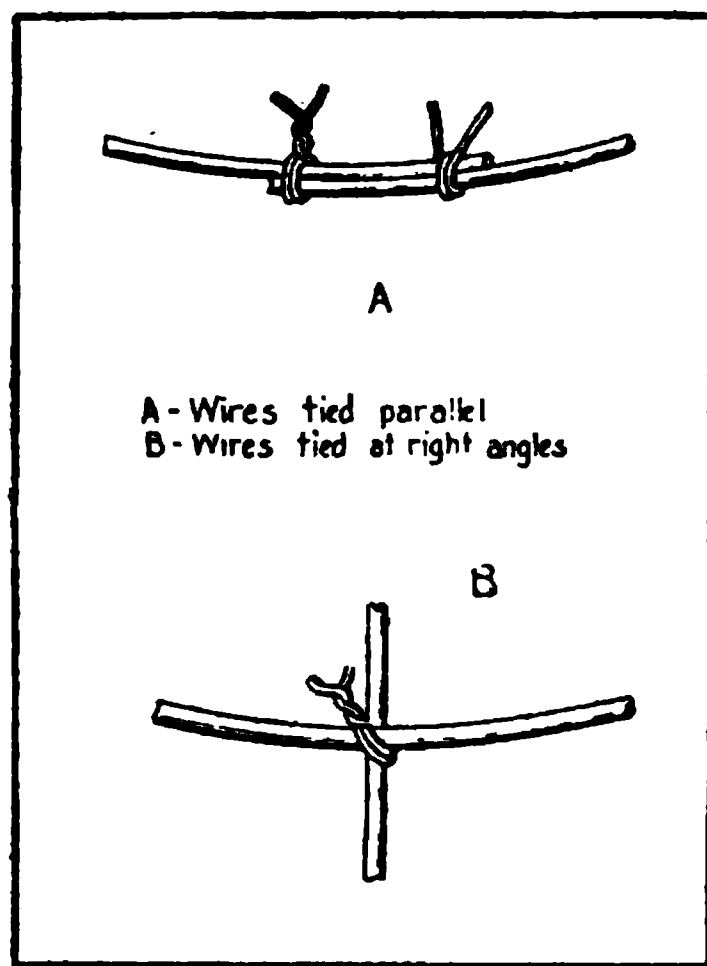


FIG. 50.—Method of using tie wire.

E. To gauge length of tie wire.

1. Pass loosely around three fingers laid parallel. Pull into an elongated loop and cut through wire at both ends of loop.

F. To fasten tie wire (fig. 51).

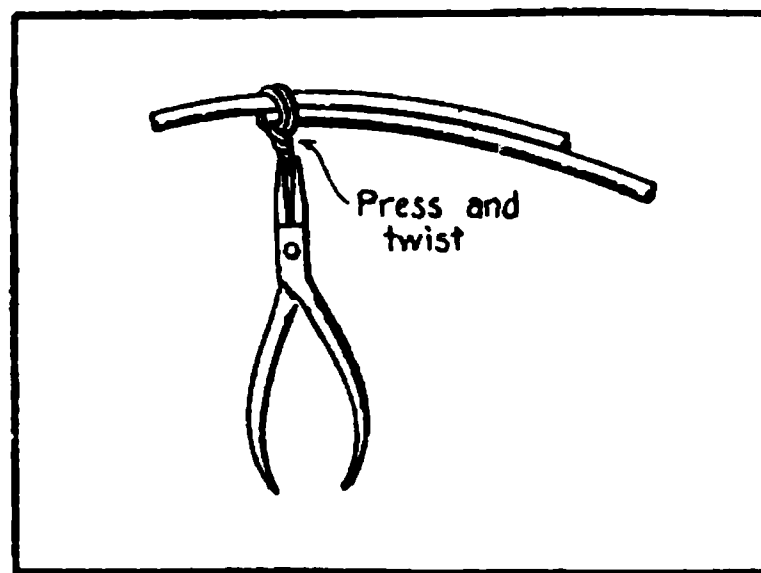


FIG. 51.—Fastening tie wires.

1. Grasp ends of tie wire with both hands and twist them tightly around each other.
2. With pliers grasp ends just at top of twist, and while pressing straight down on the twist turn the pincers about until ends of wire have twisted off.
3. Press twist flat with jaws of pliers.

G. To fasten tie wire diagonally.

1. Always wrap on the same diagonal where two wires cross each other.

II. To fasten two pieces of brace wire together without the use of tie wire (used where the end of one wire meets another) (fig. 52).

1. Hold strand of wire against the wire to which it is to be fastened, at right angles to it, with about $2\frac{1}{2}$ inches of wire extending beyond point at which twist is to be made. Use only thumb and forefinger of each hand in working.

I. Wiring frames—Continued.

II. To fasten two pieces of brace wire together without the use of tie wire—Con.

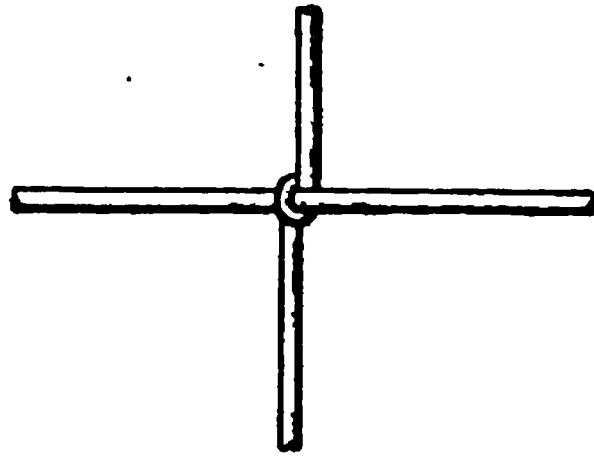
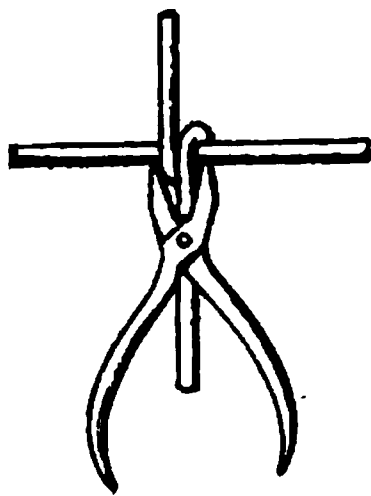
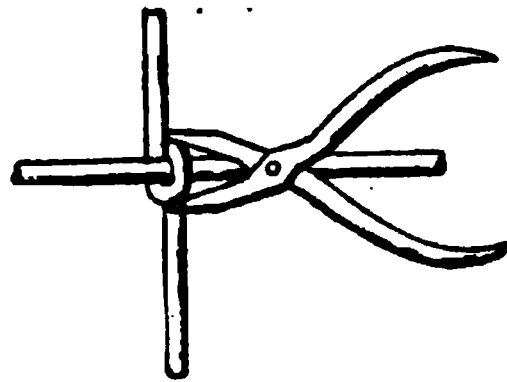


FIG. 52.—Method of fastening two brace wires together.

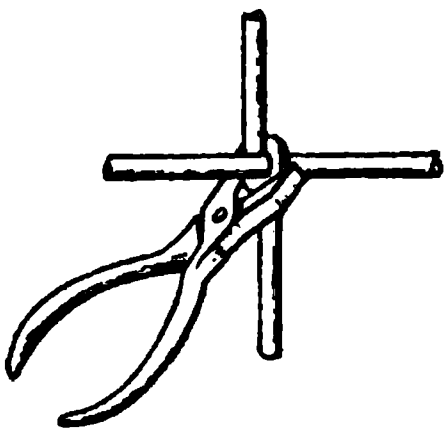
2. Press end straight backward and downward, so that it touches and lies parallel with the other end of the wire.
3. Twist enough to one side to allow wire to pass forward and up. When twist is finished the wire on one side of twist will be in a straight line with that on the other side.
4. Tighten twist with pliers, press parallel wires in twist close together, then press on twist in line with the direction in which the wires are extending, to remove all extra length. Flatten twist; cut off end and press out end flat with pliers (fig. 53).



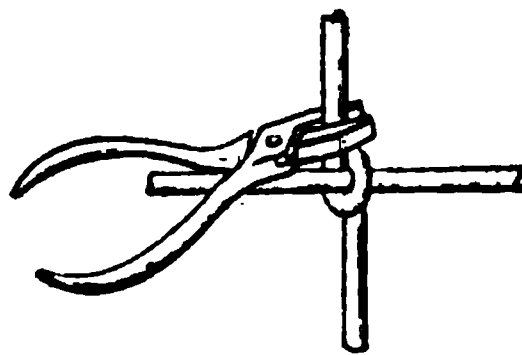
A- Press wires close together on back.



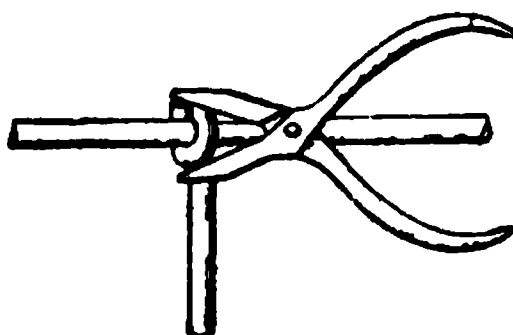
B- Press out extra fullness in loop.



C- Press twist tightly on center wire.



D- Cut off end of wire close to twist.



E- Press cut end flat.

FIG. 53.—Method of tightening brace wire.

I. Wiring frames—Continued.

I. To measure wire.

1. Pass tape measure at even tension, along outside of coil and place dot on wire at exact spot where measurement falls; be very exact in measuring.

J. Brim wires (fig. 54).

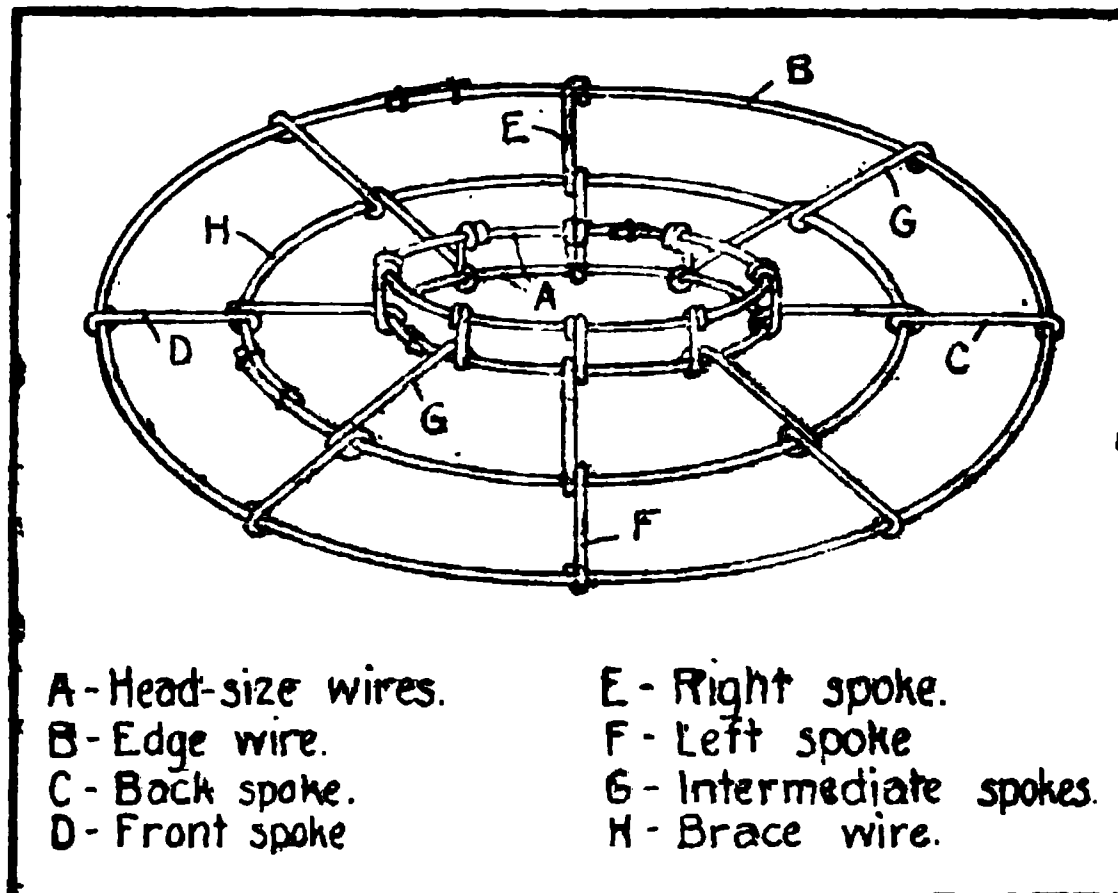


FIG. 54.—Wire frame for brim.

1. Two head-size wires of same size.
2. Edge wire—length of circumference of hat brim.
3. Spokes—eight in number, always straightened on coil before cutting.
4. Brace wires tied to spokes, between head-size and edge wire, to strengthen frame; the number of these may vary.

K. Measurements.

1. Head-size measurement plus 2-inch lap.
2. Edgewise—circumference of hat plus 2-inch lap.
3. Spokes—front, back, right, left, and four intermediate; cut wires length of spoke in brim, plus 1-inch rise between headsize wires, and extra length for wrapping at each end of wire.
4. Measurements in written directions; do not allow extra for lapping.

L. Class practice measuring, cutting, and joining wire, until it can be well and accurately done.

Home work—take measurements for becoming brims to be made next lesson.

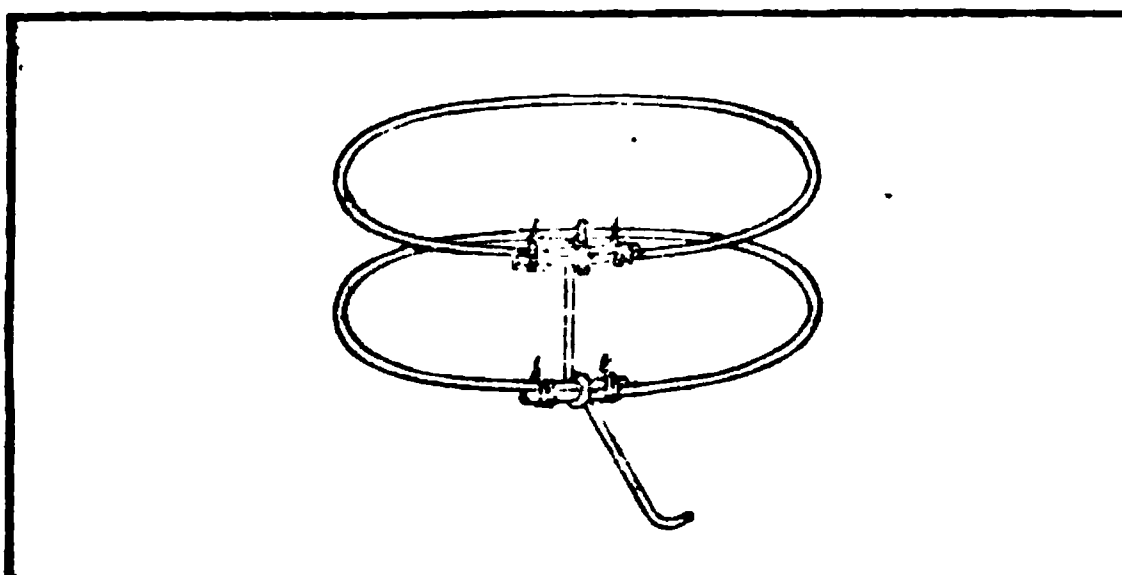


FIG. 55.—Method of placing spokes on head size.

*Lesson VIII.***I. Making wire brim (made as foundations for hats of transparent material).**

- A. Use light-weight wire, join head size; lap 2 inches and tie at each end.
- B. Measure eight equidistant points on these, beginning at center of lap, and mark with dots, for placing spokes.
- C. Place spokes (fig. 55).

1. Join back spoke to dot in center back of one head-size wire; lap in head size corner in center back; place spoke inside head-size wire before beginning to twist.
2. Measure 1 inch from the top of this twist and bend spoke out; lay other head-size wire in this angle, and complete twist; the spoke should now extend in a straight line throughout its entire length. Do not tighten the twist until the spokes are all in place.
3. Place center front spoke; then right and left, and four intermediate ones.
4. Tighten twists proceeding in the same order in which spokes were placed.

D. Shaping head size.

1. Hands inside head size, pull from front to back, until the head size has been elongated to fit shape of head.

E. Shaping brim.

1. Shape spokes to desired slant or roll.
2. Measure from point where spoke joins head-size wire to get exact length; place dot; bend wire up sharply at this point.

F. Edge wire.

1. Shape edge wire to exact shape and size; lap ends; tie.
2. Place wire on spokes so that it lies in the sharp bend at the ends.
3. Twist the spokes about the edge wire beginning at center back; work round the brim; take each spoke in order; tighten twists; cut off ends of wire; press cut ends flat.

G. Brace wires.

1. Shape brace wires; fasten at ends; tie to top of spokes. These wires show through transparent material; space them so as to form part of the design; they may later be covered with bands of material.

*Lesson IX.***I. Wire crowns.****A. Types.**

1. One which rounds continually from head size to top (fig. 56).

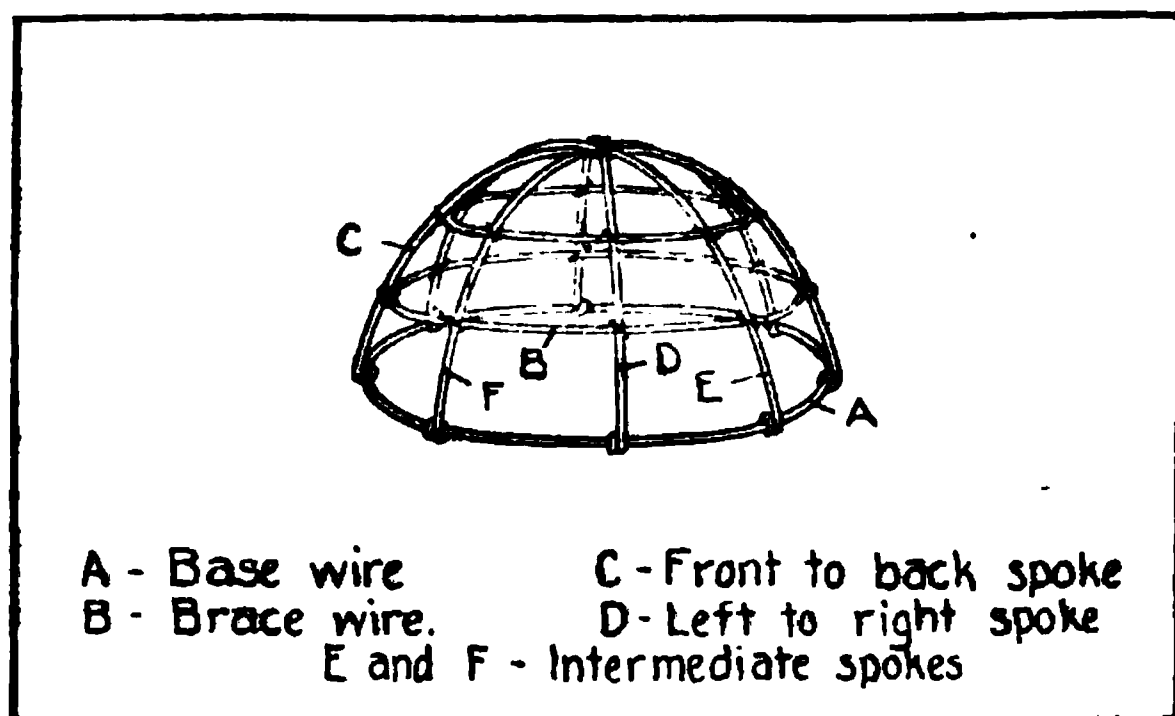


FIG. 56.—Wire frame for round crown.

I. Wiring crowns—Continued.

A. Types—Continued.

2. Straight side crown with flat or rounded top (fig. 57).

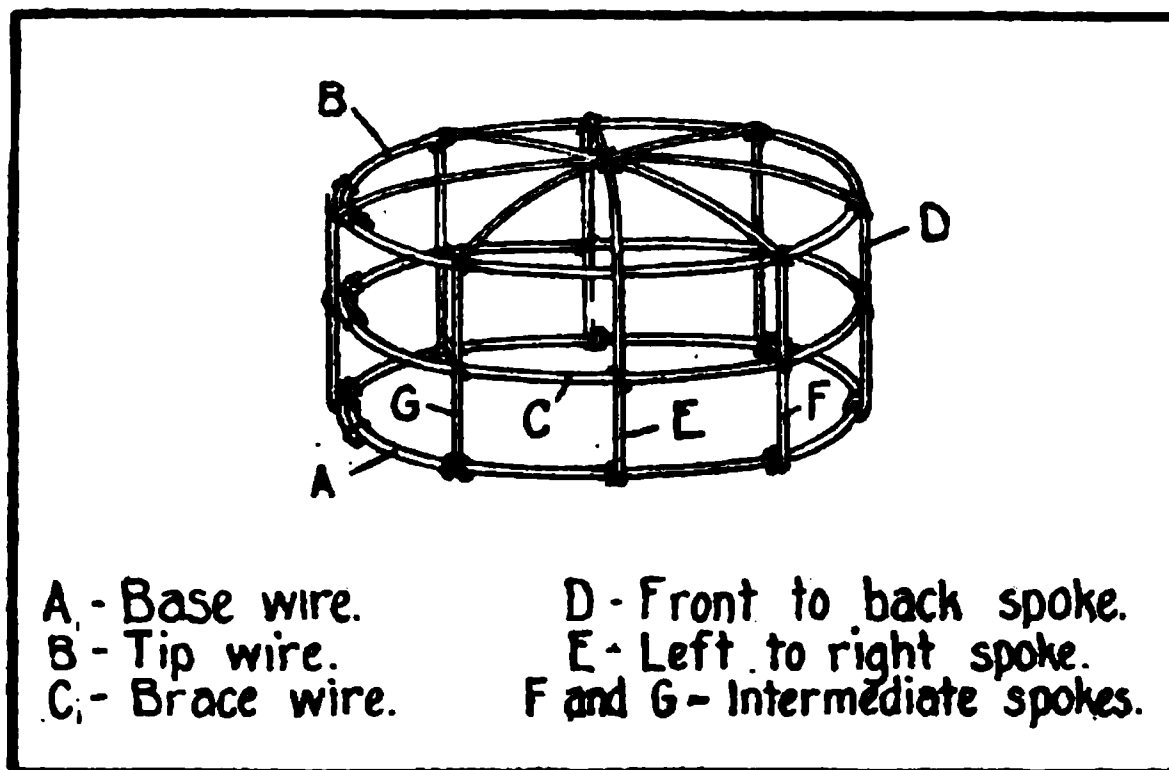


FIG. 57.—Wire frame for straight side crown.

B. Measurements.

1. Rounded crown.

- a. Base wire (that which rests on brim).
- b. Front to back spokes.
- c. Left to right spokes.
- d. Intermediate spokes.
- e. Hoop or brace wires taken 1 inch apart.

2. Crown having straight, side crown.

- a. Base wire.
- b. Tip wire (that at top of side crown, where it meets tip).
- c. Side crown spokes, back, front, etc. (8 in number).
- d. Tip spokes, back, front, etc.

C. Shaping.

1. Shape each spoke exactly as it should be when finished, bending out sharply at base where base wire is to rest; keep all bends and curves in a straight line so that wire will touch table at all points when laid down.
2. Fasten ends of base wire, mark eight equidistant points, commencing at center of lap, and shape wire to fit over head-size wires on brim.
3. Fasten spokes to brace wire; back, front and intermediate, place each over the one preceding.
4. Place tip, then brace or hoop wires where needed, and tie with tie wire; place on outside spokes.
5. Before placing tip wire on spokes, draw spokes together at the center top of tip, and fasten very loosely with tie wire which should be removed when crown is finished.

Lesson X.

I. Covering frame. Necessary material—sufficient material for covering frame.

NOTE.—If a straw hat is made, this lesson may combine work with straw and fabric coverings.

One of the frames made or altered in class may be used. Before covering frame, cover all seam edges with crinoline, so that the edges will not show through; when using light-weight materials, it is often well to place an interlining of light-weight outing flannel over the frame before placing the final covering.

A. Brim covered with fabric.

1. Upper brim first.

I. Covering frame—Continued.**B. Brim covered with fabric—Continued.**

2. Mark line in center back of frame for seam line location.
3. Place material on frame; if material has pattern, pile or gloss, consider effect of light on this, before beginning work.
4. Pin material over frame with very few pins at first, merely to keep it from slipping.
5. Begin at first; slash just inside head size for about 2 inches each side of center front and pull covering down into place; working fullness to back, first on one side, and then on the other; snip edges far enough to fit to head size; but no farther, else they may work out on the brim in fitting; make snips slant toward back.
6. Stretch smoothly and secure at edge of brim with pins at right angles to brim, and on under side of frame; slash at head size, and work out fullness at brim on both sides till facing lies smoothly in brim (fig. 58).

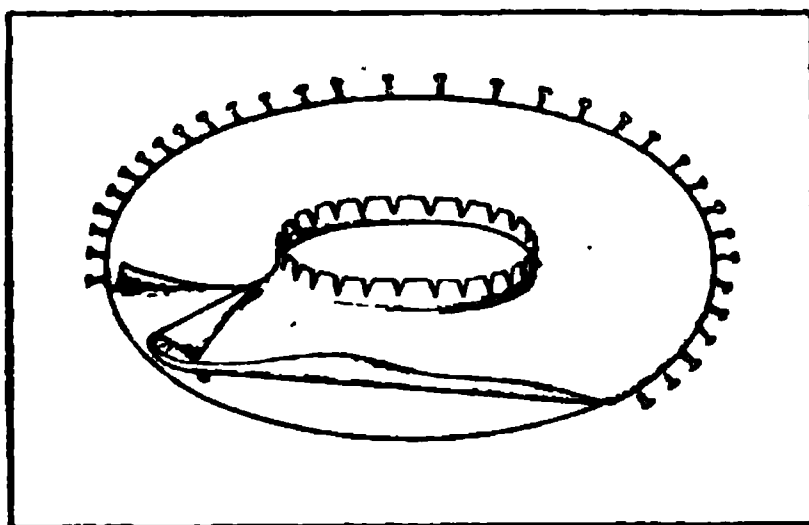


FIG. 58.—Method of covering frame with fabric.

- a. To remove wrinkles, pull material across line of wrinkles, never with it.
- b. Use pins only where necessary; in fitting pull hard in long lines across hat, with the threads of material.
7. When back is reached, cut through middle of seam line, and remove all superfluous material from the edge, leaving $\frac{1}{4}$ inch for a turning.
8. Go over work and correct any poorly fitted places.
9. Fold material back along seam line; trim to a good $\frac{1}{4}$ inch. Turn raw edges under and slip stitch, using $\frac{1}{4}$ inch stitches, commencing at the head size.
10. Trim edge $\frac{1}{2}$ inch beyond edge of brim.
11. If difficulty is experienced in covering irregular brims, milliner's glue may be used for velvets, but for satin and other materials small invisible stitches will have to be used to tack the material to place; keep line of tacking equidistant; use long stitch on under side of brim.
12. Turn edge to lower side, trim close and even with the edge, and overcast edge to frame.

B. Brim covered with braid.

1. Bind edge with braid.
2. Begin to sew braid, a short distance from back, on top of brim.
 - a. Pull braid flat and fairly tight on outside edge as it is sewed, use long stitch on under side but catch straw on upper side with tiny invisible stitches.

I. Covering frame—Continued.

B. Brim covered with braid—Continued.

3. Make gradual transition from first to second row, pinning to place to see that line is even and change not apparent (fig. 59).



FIG. 59.—Method of making transition in sewing braid to frame.

4. Continue to sew braid, lapping to keep width of braid even until one side is covered.
5. For underside proceed in same way only take greater pains with stitching; bring needle up through straw on the top; slip needle back into same place it came out; pass it between the frame and the straw for about $\frac{1}{2}$ inch; then take invisible stitch through the straw on the lower side.
6. Do not begin to sew braid on underside of brim at the same point it was begun on the top.

Lesson XI.

I. Lower brim covered with fabric.

- A. Place material over lower brim and fit, beginning at center front, fitting first one side to center back and then the other.
- B. When fitting is completed, cut around inside headsize and slash enough to allow fabric to lie smooth.
- C. Cut through center back and make seam as on top, a little to one side of the other to avoid thickness.
- D. Trim edge evenly $\frac{1}{2}$ inch from edge of brim.
- E. Paste on back to frame if necessary.
- F. Cut light weight wire, a little larger than the outer edge of brim, and shape it to fit that edge, lap and tie.
- G. Roll fabric over the wire and bring wire out on to edge of brim, pin wire to place by sticking pins through back of wire.
- H. Sew to place; to do this, stitch up from under the wire, crease material just back of wire by sliding needle point along it, take $\frac{1}{2}$ inch stitch in this crease, catch to facing from upper side with downward stitch and come back to underside very close to same place. Proceed as before all the way round.

II. Covering with braid (underside). (*See Lesson X.*)*Lesson XII.*

I. Covering crown.

A. Covering tip or rounded crown with fabric

1. Place and pin material to tip after studying pattern or gloss of material, as for brim.
2. Pull warp threads tight over tip and pin to place, either just below edge of tip, or at base of crown; heads of pins away from tip or base.

I. Covering crown—Continued.**A. Covering tip or rounded crown with fabrics—Continued.**

3. Repeat on woof threads.
4. Stretch bias part between until all or as much as possible of the fullness is removed. If fullness is left arrange this in many small plaits of equal size.
5. Sew around just below edge of tip with backstitch, and trim material away close to stitching or in case of full crown, fold material back inside of crown; trim away and catch to inside of brim.

B. Covering side crown.

1. Cut bias strip for side crown wider than height of side crown.
2. Stretch material at bottom enough to make top fit closely.
3. Pin to place; trim; turn and sew seams as before. The seam on the side crown should run on the bias in order that the seam may be made on the straight thread of the material.
4. Trim edges evenly, allowing $\frac{1}{4}$ inch extension top and bottom.
5. Turn in the top edge over wire as described in finish for under brim. Let wire raise just above tip line.
6. Finish lower edge as described above.

C. To sew crown to brim.

1. Slip stitch crown to upper brim covering, at about eight points; sew through brim to underside, and come up close to the same place needle passed through before; this to hold crown more firmly.

D. Covering crown with straw or braid.

1. Strips running lengthwise; start with center strip and work both ways to avoid crooked lines; lap braid on one side and slip edge under on the other to give a similar appearance on both sides.
2. Braid sewed around, starting at the base near the back.
 - a. Pull braid up on cord in edge, and press flat where bulges occur; make careful transition to second row.
 - b. Continue to tip with even rows and finish by punching hole in center of tip with scissors; pull end of straw through on the bias and fasten.
3. The rows may run circular in the side crown and straight on the top; to do this, cover tip first and let crown covering come up so as to conceal the ends of the tip covering.

UNIT 2.—TRIMMING HATS—THE CARE AND RENOVATION OF HATS.*Lesson I.***I. Discussion of trimmings.****A. Points worth remembering.**

1. Good feathers, though high priced are economical, because they can be used on many hats. A good feather will clean satisfactorily and will stand weathering.
2. Ribbon, if good, is an economical trimming.
3. Flowers do not always have to be used in the form in which they are bought; bunches may be broken up and the flowers used as personal taste dictates.
4. Cheap ornaments tarnish and come apart quickly; good ones will outlast many hats.
5. Hand-made trimmings have the advantage of being cheap, durable, individual and may often serve as a means of using up odds and ends.

II. Planning for trimming.

*Lesson V.***I. Linings.****A. Cap or French lining.**

1. Cut an oval for the top, any desired size.
2. Cut cord the length of the circumference of the oval, and over this shir a bias strip of material the length of the head size plus 1 inch for seams.
3. Sew to tip piece with seam at back; slip-stitch seam.
4. Pin the tip piece to the crown in place, then pin to place at the head size, turning in the raw edge.
5. Slip-stitch to hat.

B. One-piece lining.

1. Paste square piece of lining material to inside of tip.
2. Cut bias strip of material the length of the head size plus 1 inch for lap, by the depth of the head size plus 3 inches.
3. Run $\frac{1}{2}$ -inch hem in one side to serve as a casing.
4. Sew to hat as before and finish seam at back by slip-stitching.
5. Run taffeta seam binding through casing and draw up close and finish with a tiny bow. Tack to tip.

C. Lining materials.

1. China silk.
2. Light-weight taffeta.
3. Maline for transparent hats.

*Lesson VI.***I. Care of hats.****A. Reason for—**

1. Appearance.
2. Conservation.

B. Mending.

1. Tacking loosened trimmings, ornaments, or repairing rips.

C. Equipment.

1. Brushes—soft.
2. Velvet for cleaning satin, etc.
3. Hat stands; these may be made of paper or blocks of wood which have been padded.
4. Boxes as nearly dust proof as possible, or sheets of tissue paper or soft cotton materials for covering.

D. Care between seasons.

1. Protection from moths, dust, light, etc.

II. Renovation. (Hat brought from home for this purpose.)**A. Examination of hat to determine—**

1. Value of hat and trimmings for future use.
2. Kind of treatment necessary for hat and for trimmings.
 - a. Cleaning.
 - b. Pressing.
 - c. Steaming.
 - d. Dyeing.
 - e. Wiring.
3. Discussion of use of new material in combination with the old.
4. Call to mind the possibilities of the piece box at home as means of further conservation.

II. Renovation—Continued.**B. Methods of renovation.****1. Straw.**

- a. Wash with suds of good white soap and warm water; dry, first filling crown with soft paper to retain shape.
- b. Press brim.
- c. Lemon juice, or sulphur and water, are sometimes applied where a hat is badly in need of bleaching.
- d. When a hat is badly faded or light straws are badly sunburned, they may be freshened by applying one or two coats of colorite.
- e. Black Milan hats may be removed from out-of-date frames, cleaned, recolored, replaced as a new, up-to-date model.

2. Velvet.

- a. Velvet, in which the pile is in good condition, should be steamed by laying right side up on a damp cloth and passing the cloth over the surface of a hot iron.
- b. Velvet which shows signs of wear may be made to look like the "mirror" velvet by passing a moderately warm iron over its surface. Press in the direction of the pile.
- c. Light velvets may be cleaned in gasoline. Lay in gasoline, brush with a soft brush, and hang up dripping. Do not steam the same day.

3. Ribbons, silks, satins, etc.

- a. These may be cleaned with gasoline; do not press the same day.

4. Flowers.

- a. These may be tinted with water color to freshen the colors.
- b. Leaves may be dipped in very hot paraffine to restore their gloss and crispness.

5. Feathers.

- a. These may be washed or cleaned in gasoline, or with dry corn meal, and curled by pressing between the back of a knife blade (or regular feather curler) and the thumb; but if the feather is a good one it will pay to have a professional cleaner and dyer do it. Feathers are cleaned and dyed much as silk or wool would be.

6. Lace.

- a. Bits of good lace may be washed and pinned out flat to the ironing board to dry.

7. Felt.

- a. Light felts may be cleaned by rubbing with various dry cleaners, such as oatmeal, French chalk, etc., or by sponging with gasoline. They may be pressed to shape.
- b. It is usually better to have this work done by a professional worker.

*Lesson VII.***I. Continue renovation of hat and trimming materials.****II. Retrim and reline hat, using the instructions given in Lessons IV and V of this unit.**

SUGGESTIONS AND OUTLINE FOR A GROUP OF LESSONS ON CONSERVATION OF CLOTHING.

Economic factors have, within the last few years, made great changes in the supply, quality, and price of textiles. The lessening of the available supply of many raw materials, the high price and scarcity of labor and the difficulties of transportation have combined to bring about a condition where intelligent conservation of clothing is urged as a national service. While conservation has been stressed all through the course of lessons on clothing for the family, it is realized that there are groups of women who would be interested in a short group of lessons devoted to conservation alone. For these women the following group of lessons is suggested, made up from special units chosen from different sections of the course. The small amount of additional material necessary for the first lesson should be supplied by the teacher, taking care that it is reliable and up to date. The reference under "Conservation" in the bibliography should be of service here.

Lesson I.—Lecture and discussion.

- I. Reasons for conservation of clothing.
- II. Present conditions as to supplies of raw materials.
 1. Wool.
 2. Cotton.
 3. Silk.
 4. Linen.
 5. Leather.

III. Ways in which each woman can conserve.

1. Care of garments and household textiles.
2. Repair of garments and household textiles.
3. Renovation of materials.
4. Remodeling garments.
5. Careful and intelligent buying.
6. Doing without unnecessary articles.
7. Substituting a more plentiful material for a scarce one.
8. Keeping in touch with the clothing situation and governing herself according to changing conditions.

Lesson 2.—Care of clothing; repair of undergarments.

(See Section I, Unit 4, Lesson I.)

Lesson 3.—Repair of outer garments and linen.

(See Section I, Unit 4, Lesson II.)

Lesson 4.—Renovation of washable materials.

(See Section II, Unit 4, Lessons I and II.)

Lesson 5.—Renovation of silk and woolen materials.

(See Section III, Unit 4, Lesson I.)

Lesson 6.—Remodeling of simple garments.

(See Section III, Unit 4, Lesson II.)

NOTE.—Garments may be planned and started in class and finished at home, or additional lessons may be inserted here if the students desire to complete the garments in class. Helpful material on construction will be found throughout the course and should be selected by the teacher according to the type of garments which are being remodeled. Section II, Unit 3, Section III, Unit 1, and Section IV, Units 2 and 3 are especially adapted to problems in remaking garments.

Lesson 7.—Renovation of millinery materials.

(See Section V, Unit 2, Lesson VI.)

Lesson 8.—Retrimming hats.

(See Section V, Unit 2, Lesson VII.)

Suggestions for Remaking Garments.

Many of the following suggestions may not be new to the woman who has been obliged to conserve clothing in her endeavor to meet the limitations of her income. To others there may be many suggestions which will be helpful. The teachers should be alert to see the possibilities in the worn garment and to make the reclamation process as interesting as possible. Encourage local charity work.

From women's garments:**May be made:**

Wool skirt.....	Child's coat. Bloomers. Child's dress. Skirt for young girls. Small child's suit.
Wash skirt.....	Russian blouse. Child's dress.
Summer dress.....	Blouse. Petticoat. Aprons.
Silk dress.....	Petticoat. Remodel by combining with different materials.
Long coat.....	Short coat. Skirt. Child's coat.
Suit.....	Remodel with new material. One-piece dress. Dress for girls. Skirt with yoke or pockets.
Wool dress.....	Remodel by combining with different materials. One-piece dress, sleeveless waist, to use with guimpe. Child's dress.
Waist.....	Shorten sleeves; new collars or cuffs. Corset cover. White silk-protection lining for silk or wool dress.

From men's garments:**May be made:**

Man's shirts.....	Woman's sewing apron. Woman's shirt (for small woman). Child's rompers or dress. Child's apron. Boy's blouse.
Man's suit.....	Suit for boy.
Man's coat.....	Coat for girl or boy.
Man's trousers.....	Suit for very small boy.

From miscellaneous articles:**May be made:**

Stockings.....	Recut for smaller people. Petticoats; cut along seam, join; top makes hem. Children's undergarments.
Cotton or wool undergarments (adult).	Children's undergarments.
Old table linen.....	Napkins, doylies.

From miscellaneous articles:

Old muslin or cheesecloth.....
Tapestry, felt, carpet or up-
holstery goods.
Wool samples or scraps.
Outing flannel scraps.....
Gloves (kid).....
Bath towels.....

May be made:

Handkerchiefs.
House slippers.

Save and sell for reclamation.
Blankets for babies, bootees, etc.
Bootees.
Wash cloths, mats or mittens.

APPENDIX.

I.

LESSON PLAN.

(See Bibliography.)

GENERAL SUGGESTIONS FOR THE TEACHER.

A certain amount of preparation is necessary for the teacher who is to present a unit to a class. It has been noted elsewhere that the teacher is responsible for the subject matter and the practical application as well as for the best methods of presentation. In determining these, she will need a good general knowledge of her class, such as the number of students, their age, their occupations during the day, their approximate income, their purpose for choosing the course, their previous training, and their home conditions.

For each unit, the teacher needs a knowledge of good reference material and how this may be secured. She doubtless has some good books on her subject for her own use and the use of the class. Much valuable material is contained in the bulletins distributed by the United States Department of Agriculture and the Extension departments of State agricultural colleges. Local libraries can often furnish books or pamphlets, or if this help is not available, traveling libraries may be obtained for a short period, from the State library or from the United States Bureau of Education. The bibliography given in the appendix should be of service to the teacher in selecting references for the course.

Illustrative material for the unit may be obtained from various places. Models may be made by the teacher or advertising matter and samples may be obtained from manufacturers. These are distributed free or, in some cases, sold to schools at special rates. Local merchants or others will often gladly contribute or lend articles for illustrative purposes, and in some cases traveling exhibits may be obtained from State departments. Pictures, clippings, and post cards, if well chosen, are of value. Whenever possible visits should be made to stores, factories, museums, etc., which will assist in bringing out points in the work.

Certain details of preparation are also a part of the teacher's work. Often she is responsible for advertising the course and arousing interest in it. She readjusts the unit to suit local conditions, obtains necessary equipment and reference and illustrative material. She blocks out the lessons according to the time allotted, and makes a working plan for each lesson.

A lesson plan may be either in outline form or worked out in detail as seems best. There are, however, several points which should be included in every lesson plan—the aims of both teacher and students, the important topics to be considered, a few leading questions showing the methods of presentation, and the necessary assignments and reference material. The plan here outlined is given merely by way of suggestion and is intended to show, in addition to the points mentioned above, how the subject matter and the classroom procedure may be related.

LESSON PLAN FOR LESSON II, UNIT 1, SECTION IV.

I. Topic: Layette—Undergarments.

II. Teacher's Aim: To teach prospective mothers, and others interested in the subject, to appreciate, and how to make, sensible, comfortable, and proper types of undergarments, in sufficient numbers for the new baby, considering economy of time and money as an important factor. Also to increase their ability to judge and care for textile materials in common use for this purpose.

III. Aim of class.

A. If the class is one of prospective mothers the aim will be to obtain knowledge in this subject which they can use in preparing and caring for a layette.

B. If the class is composed of others than mothers, their aim must be learned and defined here.

IV. Outline of subject matter.

A. Flannel undergarments.

1. Abdominal band.

(a) Use.

(b) Directions for making.

2. Gertrudes (both flannel and cotton).

(a) Use.

(b) Directions for making.

(c) Decoration.

3. Comparison of woolen materials furnished by class for their problems.

4. Comparison of woolen materials with substituted materials.

5. Care and cleansing of woolen garments.

6. Computation of cost and comparison with different types of ready-made garments.

B. Diapers.

1. Use.

2. Direction for making.

3. Cleansing.

4. Comparison with ready made.

V. Illustrative material necessary for this unit.

A. Samples of materials suitable for layettes. Widths and prices.

B. Ready-made garments and models of the type of garments to be made in the course, also layette accessories.

C. Pictures of layette garments and accessories.

D. A doll of the infant type fully dressed or if possible a real baby.

VI. Supplies.

A. See list of equipment in Introduction, pp. 9 and 10.

B. Silk thread, silk floss, patterns, materials, buttons, tape, safety pins, (large and small sizes), nitric acid, Babbitt's lye, good white soap, drying frames for shirts and stockings.

VII. Division of time.

A. Lecture, discussion, demonstration, practical work.

NOTE.—No set time can be given for these, as the lessons vary greatly in amount of material for each. A safe rule to guide one is that the smallest proportion should be spent on lecture and the most on practical work, with enough discussion and demonstration to make points perfectly clear to the students.

Do not let discussion drag nor demonstration fail to teach a point.

Arrange for each at the time which fits best the needs of the class.

VIII. Relation of subject matter to classroom procedure.

Subject matter.	Classroom procedure.
<p>Discussion and demonstration.</p> <p>I. Use of layette—Lesson 1—To keep body of baby at normal temperature under all weather conditions.</p> <p>II. Underclothing necessary in addition to that considered in last lesson.</p> <p>A. Abdominal band.</p> <p>B. Gertrudes.</p> <ol style="list-style-type: none"> 1. Flannel. 2. Cotton. <p>C. Diapers.</p> <p>III. Comparison of garments and materials.</p> <p>A. Materials.</p> <ol style="list-style-type: none"> 1. Relative warmth, weight, softness, shrinkage, conductivity, and absorption. 2. Relative durability estimated. 3. Relative cost. <p>B. Garments.</p> <ol style="list-style-type: none"> 1. Design. 2. Comfort, and ease of adjustment. 3. Appearance after laundering. 4. Cost. <p>C. Test samples of wool.</p> <ol style="list-style-type: none"> 1. Nitric acid and ammonia. 2. Babbitt's lye (<i>see</i> Woolman and McGowan "Textiles"). <p>D. Rubber a nonconductor of air.</p> <ol style="list-style-type: none"> 1. Bad for diapers. <p>IV. Cleansing of garments.</p> <p>A. Woolen materials (<i>see</i> Lesson I).</p> <p>B. Diapers (<i>see</i> Lesson II).</p> <p>V. Directions for making band. Width 6 to 8 inches; length 18 to 20 inches. Roll ready for use.</p> <p>VI. Directions for cutting and folding diapers. Cut 18 by 36 inches. Hem two raw edges. Cut cheese cloth protector 18 inches square.</p> <p>VII. Directions for making Gertrudes.</p> <p>A. Cutting.</p> <p>B. Marking.</p> <p>C. Basting.</p> <p>D. Seams.</p> <ol style="list-style-type: none"> 1. Flannel fell. 2. Hemmed or stitched fell. <p>(<i>See</i> Baldt "Clothing for women.")</p> <p>E. Edge finishes.</p> <ol style="list-style-type: none"> 1. Scalloping. 2. Single turn on flannel. 3. Hems. 4. Discourage use of lace. Not smooth as finish. <p>F. Shoulder closings.</p> <ol style="list-style-type: none"> 1. Tapes. 2. Buttons. 3. Safety pins. <p>VIII. Assignment of class work. Making of flannel Gertrude.</p> <p>IX. Determine exact stage of work reached.</p> <p>X. Assignment of homework. Finishing work of problem.</p> <p>XI. Need for infant outfits in city nurseries, hospitals, and charitable institutions.</p>	<p>Approach to lesson.</p> <p>What was the thought brought out in our last lesson regarding the use of the layette?</p> <p>What additional garments do you consider the baby should wear in winter to meet this requirement? In summer?</p> <p>Class examine sample garments and note advantages and disadvantages in each with view to adopting good ideas.</p> <p>Compare ready-made garments with teacher's models and materials brought in for classroom work. Standards for comparison given in previous lesson.</p> <p>From the comparisons made do you consider it more economical in the long run for you to buy or make the undergarments for your layette?</p> <p>Of the materials which you have examined which would you recommend as the best grade of woolen flannel for this use? Which cotton flannel, etc.?</p> <p>How does the use of rubber in clothing affect the part of your body which it covers? From this what conclusion do you reach regarding the use of rubber diapers for the infant?</p> <p>Review care of woolen materials from Lesson I. How will you launder the flannel Gertrude? Give reasons for changes from ordinary laundry procedure. What special care is necessary in cleansing diapers.</p> <p>Teacher demonstrate making band; cutting on thread and rolling. Class prepare band. Why don't we hem the band?</p> <p>Teacher demonstrate making diaper. Class cut, turn, baste, hem, and fold. Review hemming stitch.</p> <p>Review cutting, marking, basting, and use of machine if members of class need it.</p> <p>Demonstrate method of making flannel fell. Review hemmed and stitched fell. Why wouldn't you use a hemmed fell seam on a flannel garment? Review scalloping and briar stitching.</p> <p>Would you advise use of lace as a neck and armhole finish? Give reason for your answer. Which of the closings noticed in the finished garments do you prefer? Why?</p> <p>Give concise statements of the information gained from the demonstration and discussion of the making of the Gertrude.</p> <p>Class work under supervision of teacher until within 10 minutes of time for dismissal.</p> <p>What have been the main points made in our lesson to-night?</p> <p>What have we left to do at home before the next lesson?</p> <p>What have you gotten from this lesson which will be of future value to you? In what ways can you use the knowledge?</p>

IX. Reference material for lesson:

Delineator, September, 1918, page 33.

Delineator, July, 1917, page 30.

Modern Priscilla, July, 1915, page 34.

Modern Priscilla, October, 1916, page 51.

Modern Priscilla, May, 1917, pages 24 and 40.

Modern Priscilla, February, 1918, page 14.

R. Dennett, "The Healthy Baby."

F. H. MacCarthy, "Hygiene for Mother and Child."

II.

SCORE CARDS FOR FINISHED GARMENTS.¹

	Possible score.	Points deficient.	Actual score.
Suitability of article to purpose.....	25	.....	.....
Beauty and quality of the design.....	10	.....	.....
Harmony of color and materials.....	15	.....	.....
Symmetry and accuracy in cutting.....	20	.....	.....
Perfection of stitches.....	15	.....	.....
Neatness of finish.....	15	.....	.....
	100	.....	.....

¹ Adapted from Bulletin XI, No. 11, p. 21, Missouri State Board of Agriculture, and Bulletin 255, United States Department of Agriculture, Office Experiment Station.

SCORE CARD FOR DRESSMAKING (UNIVERSITY OF NEBRASKA, 1917).

	Per cent.
1. Design.....	25
a. Line.	
b. Color.	
c. Suitability as to type and occasion.	
d. Silhouette.	
e. Originality and individuality.	
2. Selection of material.....	15
a. Color.	
b. Suitability as (use and age).	
c. Trimming.	
d. Durability.	
3. Technique.....	25
a. Cutting.	
b. Fitting	
c. Workmanship.	
d. Pressing.	
e. Neatness.	
4. Hygiene.....	15
a. Cut and construction.	
b. Material.	
c. Cleaning qualities.	
5. Cost.....	10
a. Value of money expended.	
b. Standard of living.	
c. Relationship of trimming to material.	
6. Ethics.....	10
a. Modesty.	
b. Influence.	

III.

BIBLIOGRAPHY.

The bibliography given below includes a comprehensive list of references for the entire course on "Clothing for the Family." References are given under headings, arranged alphabetically. While it is not necessary for all these references to be at hand, the teacher should see that at least one or two standard references are provided for each subject, and as many more as can be obtained. Most of the bulletins from

the various States are published by the extension department of the State Agricultural College and are for free distribution within the State. Where no State bulletins are listed, information as to available publications may be obtained by writing to the State College of Agriculture. The U. S. Government bulletins may be obtained from the department issuing them at Washington, D. C. A list of all new publications may be had on request. Teachers should encourage students to obtain such bulletins as meet their especial needs, to use them freely in class work, and to keep them as a permanent reference for future work.

I. PRINCIPLES OF SEWING, ELEMENTARY DRESSMAKING, EQUIPMENT, USE OF PATTERNS, AND SEWING MACHINES.

A. STATE BULLETINS.

1. Arizona. University. College of agriculture. Agricultural extension dept. Tucson. A handbook in sewing for girls. 1917. 22 p. (Extension service circular 18.)
2. Colorado agricultural college. Extension service. Fort Collins. Girls' sewing club. First and second years. 1916. 2 pamphlets. (Extension bulletin. Ser. 1, nos. 111. and 112.) Bulletin 111 reprinted 1917 as Ser. 1, no. 124.
3. Hampton, Va. Normal and agricultural institute. Sewing for rural schools. 1916. 15 p. (Hampton leaflets. vol. VII, no. 7.)
4. Idaho. University. Extension division. Moscow. Sewing bulletin. Idaho sewing clubs. 1916. 16 p. (Extension bulletin no. 17.)
5. Illinois. University. College of agriculture, Urbana. Suggestions for garment making. 1917. 61 p. (Extension circular no. 14.)
6. Iowa state college of agriculture and mechanic arts, Ames. Garment making club. Part I—Preparatory work, 2d ed. 1915. 30 p. (Junior circular no. 26.)
 ——— Garment making club—Part II. 1915. 32 p. (Junior circular no. 35.)
 ——— Garment making club—Part III. Dressmaking. 1916. 16 p. (Junior circular no. 39.)
 ——— Courses of work for 1911. Iowa boys and girls club. Domestic science. Cooking . . . Sewing . . . 1911. 40 p. (Circular 14.)
 ——— Courses of work. Iowa boys and girls club. Domestic science. Cooking . . . Sewing . . . 1912. 28 p. (Circular 15.)
 ——— Courses of work. Iowa boys and girls club. Course V. Sewing. 1912. 11 p. (Circular 22.)
7. Kansas state agricultural college. Division of college extension, Manhattan. The sewing clubs. Instructions for members and leaders. 1916. 34 p. (Extension bulletin no. 8.)
8. Kentucky. University. Lexington. Demonstration of practical sewing. (Circular 47.)
9. Michigan agricultural college. Extension division. East Lansing. Fact about clothing. May, 1914. 6 mimeographed sheets.
10. Minnesota. Dept. of education. St. Paul. Industrial courses for consolidated schools. (Bulletin 42.)
11. Missouri. University. College of agriculture. Agricultural extension service. Columbia. Principles of sewing. 1917. 28 p. (Circular 41.)
12. Nebraska. University. College of agriculture. Extension service. Lincoln. Alteration of patterns. [1917.] 2 p. (Textiles circular no. 7.) Mimeographed.
 ——— Girls sewing club. Course I. Lessons 1-12. 1916. 8 pamphlets.
 ——— Sewing equipment. [1917.] 2 p. (Textiles circular no. 6.) Mimeographed.

13. Nevada. College of agriculture. Reno. Clothing; elementary lessons in sewing the principles of color in dress, and home dressmaking. 1916. (Agricultural extension state service bulletin 6.)
 ——— Elementary sewing. 1917. 4 p. (Agricultural leaflet 5.)
14. New Mexico. University. College of agriculture. Albuquerque. Girls' sewing club lessons and instructions for 1917. 1916. 18 p. (Extension circular no. 16.)
15. New York state college of agriculture, Ithaca. Hand sewing by Julia Gleason. Cornell rural school leaflet. vol. XI, no. 1, Sept. 1917. p. 215-152.
16. Ohio state university. Agricultural college extension service. Columbus. Clothing club—Introduction and Lesson 1. 1917/18. 8 p. (Extension circular vol. III, no. 43.)
 ——— Clothing club. Lessons 11 and 12. School dress. 1917/18. 8 p. (Extension circular, vol. III, no. 48.)
 ——— Sewing. 1916/17. 15 p. (Agricultural college extension bulletin. vol. XII, no. 9.)
17. Oklahoma agricultural and mechanical college. Extension division. Stillwater. Sewing bulletin for club members. 1918. 7 p. (Circular no. 69.)
18. Oregon agricultural college. Extension service. Corvallis. Sewing club lessons. 1916. 13 pamphlets. (Extension bulletin 168-180.)
 ——— Stitches, seams and sewing processes. 1917. 16 p. (Extension bulletin 197.)
19. Pennsylvania state college. Dept. of agricultural extension. State college. Dressmaking at home. 1917. 24 p. (Extension circular no. 70.)
20. Purdue university. Dept. of agricultural extension. Lafayette, Ind. Helps for club members—Girls' sewing club. 1913. 15 p. (Extension bulletin no. 23.)
 ——— ——— Helps for club members—Sewing clubs (advanced work). 1915. 8 p. (Extension bulletin no. 37.)
21. Wisconsin. University. College of agriculture. Extension service. Madison. Sewing for girls. 1916. 36 p. (Circular 65.)
22. Wyoming. University. College of agriculture. Division of extension. Laramie. Instruction in sewing. October 1915. 16 p. (Boys' and girls' club work. vol. II, no. 1.)

B. BOOKS.

1. American dressmaking, step by step. Pictorial review company, New York.
2. Baldt, Laura Irene. Clothing for women. 1916. 454 p.
3. Dressmaker. Butterick publishing company, New York. 1911. 130 p.
4. Elrich, Olive and Hune, Hazel. Sewing efficiency. 1914. 70 p.
5. Fales, Jane. Dressmaking. 1917. 508 p.
6. Hasluck, Paul N. Sewing machines; their construction, adjustment and repair.
7. Kinne, Helen and Cooley, Anna M. Shelter and clothing. 1913. 377 p.
8. Sill, Ruth P. Outline of a course in elementary clothing and handwork. 1913. 15 p. (Columbia university. Teachers college bulletin. 5th ser. no. 7. Technical education bulletin no. 21.) "References": p. 15.
9. Woolman, Mrs. Mary Schenck. A sewing course. 1908. 136 p.

II. BIBLIOGRAPHIES.

A. BULLETINS.

1. Columbia university. Teachers college. Speyer school. New York. Tentative course of study in household arts for seventh and eighth grades. 1914/15. 31 p. (Teachers college bulletin. 6th ser. no. 16. Technical education bulletin no. 29.) "Household arts bibliography": p. 27-31.
 ——— ——— School of household arts. Annotated list of books relating to household arts. Rev. ed. (Teachers college bulletin. Technical education bulletin no. 85.)

2. Iowa state college of agriculture and mechanic arts. Agricultural extension dept. Ames. Valuable books and bulletins on home economics. 1917/18. 8 p. (Home economics circular no. 6.)
3. U. S. Bureau of education. List of publications of the United States Bureau of education available for free distribution. September 1912. 37 p. (Bulletin 1912, no. 25.)
4. U. S. Bureau of education. List of references on education for the home. *In* Education for the home, by Benjamin R. Andrews. Pt. IV. 1915. p. 5-41. (Bulletin 1914, no. 39.)
5. U. S. Dept. of agriculture. Division of publications. Monthly list of publications.

B. BOOKS.

1. Baldt, Laura Irene. Clothing for women. 1916.
2. Cooley, Anna M. Domestic art in woman's education. 1911. 274 p.
3. Fales, Jane. Dressmaking. 1917. 508 p.

III. Boy's Suits.

1. American dressmaking. Pictorial review company, New York.
2. Dressmaker. Butterick publishing company, New York. 1911. 130 p.

IV. BUDGETS.

A. BULLETINS.

1. Devine, Edward T. Economic function of woman. 1910. 16 p. (Columbia university. Teachers college bulletin. 2d ser., no. 3. Technical education ser. A, no. 1.)
2. U. S. Bureau of labor statistics. Monthly review. Recent numbers contain valuable articles on budgets.

B. MAGAZINE ARTICLES.

1. Wharton, Elna H.
 Adjusting the income to the outlay. Delineator, 91:32, July 1917.
 Aping one's neighbors. Delineator, 91:23, August 1917.
 Burning question of fuel. Delineator, 91:22, Nov. 1917.
 Conservation of food. Delineator, 91:23, Sept. 1917.
 Elimination of waste. Delineator, 91:24, Sept. 1917.
 Getting on in life. Delineator, 92:30, February 1918.
 How to make a budget. Delineator, 91:23, July 1917.
 Picturesque market basket has become a sober responsibility. Delineator, 91:30, October 1917.
 Putting muscle and brain into home making. Delineator, 91:39, December 1917.
 What is thrift? Delineator, 90:24, June 1917.

C. BOOKS.

1. Andrews, Benjamin R. A survey of your household finances. 1914. 16 p. (Columbia university. Teachers college bulletin. 6th ser., no. 7. Technical education bulletin no. 26.)
2. Baldt, Laura Irene. Clothing for women. 1916.
3. Kinne, Helen and Cooley, Anna M. Foods and household management. 1914. 401 p.
4. ——— Shelter and clothing. 1913. 377 p.
5. Richards, Ellen Henrietta. Cost of living as modified by sanitary science. 1905.

6. Streightoff, Frank Hatch. The standard of living among the industrial people of America. 1911. 196 p.
7. U. S. Bureau of labor. Annual report of the commissioner of labor. 18th, 1903. Cost of living.
8. Woolman, *Mrs. Mary Schenck and McGowan*, Ellen Beers. Textiles. 1913. 428 p.

V. CARE AND CLEANSING OF CLOTHING.

A. BULLETINS.

1. Alabama polytechnic institute. Extension service. Auburn. Dry cleaning at home. 1917. 4 p. (Home and farm conveniences no. 5.) Mimeographed pamphlet.
2. Denton, Tex. College of industrial arts. Dept. of extension. How to use, care for and buy the family wardrobe.
3. Iowa state college of agriculture and mechanic arts. Ames. Textiles—their care and use. Rev. 1917/18. 23 p. (Home economics bulletin no. 4.)
4. Nebraska. University. Lincoln. Care of clothing and cleaning. (Extension home economics ser. 3, Circular 3.)
5. U. S. Dept. of agriculture. Carpet beetle or Buffalo moth. 1914. 4 p. (Farmers bulletin no. 626.)
 ——— True clothes moths. 1915. 8 p. (Farmers bulletin no. 659.)
 ——— Removing stains from clothing, and other textiles. 1917. 35 p. (Farmers bulletin no. 861.)

B. BOOKS.

1. Balderston, Lydia R. Laundering. 1914. 214 p.
2. Bryannt, William T. Practical dry cleaner, scourer and garment dyer. 1911. 351 p.
3. Kinne, Helen *and* Cooley, Anna M. Shelter and clothing. 1913. 377 p.
4. Osman, Eaton Goodell. Cleaning and renovating at home. 1910. 193 p.
5. Woolman, *Mrs. Mary S. and McGowan*, Ellen Beers. Textiles. 1913. 428 p.

VI. COLOR.

A. BULLETINS.

1. Iowa state college of agriculture and mechanic arts. Ames. Textiles—their care and use. Rev. 1917/18. 23 p. (Home economics bulletin no. 4.)
2. Nebraska. University. College of agriculture. Extension service. Lincoln. Color combination in clothing. [1917] 2 p. (Home economics extension work. Textiles circular no. 8.) Mimeographed.

B. BOOKS.

1. Baldt, Laura Irene. Clothing for women. 1916. 454 p.
2. Bell, Clive. Art. 1914. 292 p.
3. Dow, Arthur Wesley. Composition; a series of exercises in art structure. 1913. 128 p.
4. Munsell, Albert Henry. A color notation. 1905. 89 p.
5. Prang, Louis. Color instruction. 1893. 187 p.

VII. CONSERVATION OF TEXTILES AND ECONOMY OF PURCHASE.

A. BULLETINS.

1. Iowa state college of agriculture and mechanic arts. Extension dept. Ames. Household conservation. Part II. Textiles. 3d ed. 1917. 4 p. (Emergency leaflet no. 5.)

2. Minnesota. University. Agricultural extension division. Minneapolis. Clothing conservation for home and community service. 1918. [4] p. (Special bulletin no. 25.)
3. Nebraska. University. Lincoln. Conservation of clothing. [1917] 4 p. (Home economics extension work. Textiles circular no. 5.) Mimeographed.
 ——— The planning of an economic wardrobe. 1917. 4 p. (Textiles circular no. 9.) Mimeographed.
 ——— Economy in buying. 1917. 2 p. (Emergency bulletin no. 11.) Mimeographed.
 ——— Economy in shoes. 1917. 1 p. (Emergency bulletin no. 12.) Mimeographed.
 ——— How can I make my clothes last longer? 1917. 4 p. (Emergency bulletin no. 22.) Mimeographed.
4. U. S. Bureau of education. Home economics teaching under present conditions. [1917.] 11 p. (Home economics circular no. 1, Sept. 5, 1917.)
5. U. S. Dept. of agriculture. States relation service. Office of extension work, North and West. Conservation of clothing, suggestions for committee work . . . 1917. 9 mimeographed sheets. (W. S. III-12.)
6. Woolman, Mrs. Mary S. Hints on clothing. 1911. 7 p. (Columbia university. Teachers college bulletin. 2d ser., no. 13. Technical education ser. A, no. 4.)

B. MAGAZINE ARTICLES.

1. Moisture the enemy of clothes conquered. Modern Priscilla, February 1918.
2. Patriotic women look to your clothes. Modern Priscilla, November 1917.
3. The clothing situation. Journal of Home Economics. September 1918.
4. The following magazines usually print good articles each month: Delineator; Good housekeeping; Harper's bazaar; Ladies home journal; McCall's magazine; Vogue, etc.

VIII. DECORATION.

A. BULLETINS.

Most of the state bulletins in the first list deal with some phases of this subject.

B. BOOKS.

1. Baldt, Laura Irene. Clothing for women. 1916. 454 p.
2. Day, Lewis F., and Buckle, Mary. Art in needlework. 1900. 262 p.
3. Embroideries and their stitches. Butterick publishing co., 1905. 112 p.
4. Encyclopedia of needlework. Dollfust, Mieg & cie.
5. Fales, Jane. Dressmaking. 1917. 508 p.
6. Goldenberg, Samuel L. Lace, its origin and history. 1904. 77 p.
7. Sharp, Mary. Point and pillow lace. 1905. 202 p.

IX. DYEING.

A. BOOKS.

1. Owen, Frank Allen. The dyeing and cleaning of textile fabrics. 1909. 253 p.
2. Pellew, Charles E. Dyes and dyeing. 1918. 274 p.
3. Woolman, Mrs. Mary S. and McGowan, Ellen Beers. Textiles. 1913. 428 p.

X. DRESS FORM, DESIGNING AND DRAFTING.

A. BULLETINS.

1. Denton, Tex. College of industrial arts. Suggested clothing for the high school girl.
2. Iowa state college of agriculture and mechanic arts. Agricultural extension dept. Ames. Planning the costume. 1917. 20 p. (Home economics bulletin no. 9.)

3. Missouri. University. College of agriculture. Agricultural extension service. Columbia. Principles of sewing. 1917. 28 p. (Circular 41.)
4. Nebraska. University. College of agriculture. Extension service. Lincoln. Suggestions for designing clothes. [1917] 2 p. (Textiles circular 4.) Mimeographed.
5. Ohio state university. Agricultural college. Columbus. Textiles and dress. 1915. 15 p. (Extension bulletin, vol. X, no. 5.)
6. Washington state college. Pullman. Home made dress form. 1917. 2 p. (Home economics extension circular no. 11.)
7. Winthrop normal and industrial college, South Carolina. Textiles and clothing. (Home demonstration course for women of South Carolina. Lesson 12.)

B. BOOKS.

1. Baldt, Laura Irene. Clothing for women. 1916. 454 p.
2. Fales, Jane. Dressmaking. 1917. 508 p.
3. Hughes, Talbot. Dress design. 1913. (Artistic crafts ser. of technical handbooks.)
4. Kinne, Helen *and* Cooley, Anna M. Shelter and clothing. 1913. 377 p.
5. Trepnager, Costume design.

XI. ILLUSTRATIVE MATERIAL.

A. BULLETINS.

1. Columbia university. Teachers college. School of practical arts. Dept. of household arts. New York. Address list for equipment and supplies for instruction in household arts. [1913] 14 p. Teachers college bulletin. 5th ser. no. 6. (Technical education bulletin no. 20.) Rev. ed. of Technical education bulletin no. 12.
2. Columbia university. Teachers college. Speyer school. New York. Tentative course of study in household arts for seventh and eighth grades. 1914/15. 31 p. (Teachers college bulletin. 6th ser., no. 16. Technical education bulletin no. 29.)

B. BOOKS.

1. Baldt, Laura Irene. Clothing for women. 1916. 454 p.

XII. LAUNDERING.

A. BULLETINS.

1. Cornell university, Ithaca, N. Y. The laundry. In Cornell reading-courses. Lesson for the farm home. vol. I, no. 11. Farm home series no. 3. March 1, 1912. p. 110-52.

B. BOOKS.

1. Balderston, Lydia R. Laundering. 1914. 214 p.
2. Marsh, E. L. Laundry work in theory and practice. 1914. 205 p.
3. Rankin, Margaret C. The art of laundry work.
4. ——— The science of laundry work.
5. Vail, Mary B. Approved methods of home laundering. 1906. 68 p.
6. Woolman, Mrs. Mary S. *and* McGowan, Ellen Beers. Textiles. 1913. 428 p.

XIII. SOCIAL AND ECONOMIC PHASES.

A. BULLETINS.

1. Iowa state college of agriculture and mechanic arts. Ames. Textiles—their care and use. Rev. 1917/18. 23 p. (Home economics bulletin no. 4.)
2. Nebraska. University. College of agriculture. Extension service. Lincoln. Women's club outlines. [Clothing and textiles.] [1916] 5 p. (Extension home economics series 2. Circular no. 5.)

3. U. S. Bureau of labor. Report on condition of woman and child wage earners in the United States. 1910-13. 19 v.
4. Of value in this work would be the publications and reports of the National Consumers League, address Mrs. Florence Kelley, 105 E. 22d St., New York, N. Y.

XIV. LAYETTE AND CHILDREN'S CLOTHING.

A. BULLETINS.

1. Iowa state college of agriculture and mechanic arts. Agricultural extension dept. Ames. Physical efficiency. 1917/18. 8 p. (Short course class notes. no. 13.) "Clothing": p. 5-7.
2. Minnesota. University. Agricultural extension dept. Minneapolis. Minnesota boys' and girls' clubs. Sewing project. 1918. 8 p. (Special bulletin no. 18.)
3. Pennsylvania state college. Dept. of agricultural extension. State College. Children's clothing. 1916. (Extension circular 48.)

B. MAGAZINE ARTICLES.

1. Clothes for the new baby. Modern Priscilla. May 1917.
2. Complete wardrobe for the baby. Modern Priscilla. July 1915.
3. Hot weather clothing for the baby. Delineator. Sept. 1918.
4. Mother problems. Modern Priscilla. May 1917.
5. New baby. Modern Priscilla. July 1915.
6. Refugee garments. Modern Priscilla. May 1917.
7. Delineator, Sept. 1917.

C. BOOKS.

1. Dennett, Roger Herbert. The healthy baby. 1912. 235 p.
2. MacCarthy, Francis Hamilton. Hygiene for mother and child. 1910. 295 p.
3. Sayne, M. B. Simple garments for children. 48 p.

XV. MILLINERY.

A. BULLETINS.

1. Iowa state college of agriculture and mechanic arts. Schools section. Extension dept. Ames. Courses of work. Iowa boys' and girls' club. Domestic science. Sewing. 1912. 17 p. (Circular 24.)

B. MAGAZINE ARTICLES.

1. McCalls' prior to 1918 gave home millinery lessons.

C. BOOKS.

1. Bottomley, Julia. Practical millinery lessons. 1914. 125 p.
2. Department store merchandise manuals. The millinery department. 1918. Vol. 8.
3. Kinne, Helen and Cooley, Anna M. Shelter and clothing. 1913. 377 p.
4. Laughlin, Clara E. The complete dressmaker. 1907. 342 p.
5. Reeve, Amy J. Practical home millinery. 1912. 96 p.
6. Tobey, Evelyn C. Hand made flowers. 1914. 19 p.

XVI. METHODS, COURSES OF STUDY, ETC.

A. BULLETINS.

1. American home economics association. Syllabus of home economics. 1913. 69 p. (Publication no. 1.) (Secretary, Mrs. A. P. Norton, 2814 Adams Mill Road, Washington, D. C.)
2. Massachusetts. Board of education. Boston. Household arts. Teachers manual and course of study for grades 7-10. 1916. 154 p. (Bulletin 1916, no. 29. Whole no. 78.)

3. National education association. Dept. of vocational education and practical arts. Committee on vocational education and vocational guidance. Vocational secondary education. 1916. 163 p. (U. S. Bureau of education. Bulletin 1916, no. 21.)
4. U. S. Bureau of education. Principles and policies in home economics education. 1918. 23 p. (Home economics circular, no. 4. April 1918.)
5. U. S. Dept. of agriculture. States relation service. First year course in home economics for southern schools. 1917. 56 p. (Bulletin no. 540.)

B. BOOKS.

1. Baldt, Laura Irene. Clothing for women. 1916. 454 p.
2. Cooley, Anna M. Domestic art in women's education. 1911. 274 p.
3. Earhart, Lida Belle. Types of teaching. 1915. 277 p.
4. Horn, H. M. The art of questioning.
5. Norsworthy, Naomi and Strayer, George Drayton. How to teach. 1917. 297 p.

XVII. REMODELING.

A. BULLETINS.

1. Colorado agricultural college. Extension service. Fort Collins. Girls' sewing club. (Third year) 1918. 34 p. (Extension bulletin, ser. 1, no. 132.)
2. Michigan agricultural college. East Lansing. Facts about clothing. May 8, 1914.
3. Talbot, Mrs. Anna Hedge. Thrift clothing. 1918. 30 p.
4. Wisconsin. University. College of agriculture. Madison. New clothes at small cost. 1917. 8 p. (Circular 91.)
5. U. S. Bureau of education. Home economics teaching under present conditions. [1917] 11 p. (Home economics circular no. 1. Sept. 5, 1917.)
6. Worcester County, Mass. Farm bureau. Suggestions for remodeling garments.

XVIII. TEXTILES.

A. BULLETINS.

1. Columbia university. Teachers college. New York. The determination of cotton and linen. 1911. (Teachers college bulletin. Technical education bulletin no. 7.)
2. Cornell university. Ithaca, N. Y. Hints on choosing textiles. Cornell reading-courses. Lesson for the farm. vol. II, no. 45. Household textile ser. no. 1. Aug. 1, 1913. p. 209-18.
3. Illinois. University. Agricultural extension. Urbana. Some points in choosing textiles. 1910. 18 p. (University of Illinois bulletin. vol. VIII, no. 15. Dept. of household science.)
4. Iowa state college of agriculture and mechanic arts. Ames. Textiles—their care and use. Rev. 1917/18. 23 p. (Home economics bulletin no. 4.)
5. Minnesota. University. Agricultural extension division. Minneapolis. Textiles, what every homemaker should know. 1917. 20 p. (Special bulletin no. 15.)
6. Nebraska. University. College of agriculture. Extension service. Lincoln. Chemical testing. (Extension home economics ser. 3, Circular 2.)
—— Comparison of textile fibers. (Extension home economics ser. 3, Circular 4.)
7. Ohio state university. Agricultural college. Columbus. Extension service. Clothing club. Lessons 4-9. 1917/18. 3 pamphlets. (Extension circular vol. III, nos. 45, 46, 47.) Contain articles on cotton.
—— Textiles and dress. 1915. 15 p. (Extension bulletin, vol. X, no. 5.)

8. Oregon agricultural college. Extension service. Corvallis. Cotton. (Extension bulletin no. 179. p. 3-4.)
 ——— Linen. (Extension bulletin no. 176. p. 3-4.)
 ——— Need of textile study. (Extension bulletin no. 173, 177. p. 6-8; p. 2-4.)
 ——— Some points in choosing textiles. 1917. 16 p. (Extension bulletin no. 188.)
9. Tennessee. University. College of agriculture. Division of extension. Knoxville. How to choose woollens. 1915. (Publication no. 12. Home economics ser. no. 6.)
10. U. S. Dept. of agriculture. Flax culture. 1907. 36 p. (Farmers bulletin no. 274.)
 ——— Office of experiment stations. Cotton plant. 433 p. - 1896. (Bulletin no. 33.)
11. Winthrop normal and industrial college, South Carolina. Textiles and clothing. (Home demonstration course for women of South Carolina. Lesson 12.)

B. MAGAZINE ARTICLE.

1. The cloth you buy. Modern Priscilla. February 1918.

C. BOOKS.

1. Baldt, Laura Irene. Clothing for women. 1916. 454 p.
2. Barker, Alfred Farrer. An introduction to the study of textile design. 1903. 211 p.
3. ——— Textiles. 1910. 375 p.
4. Bowman, Frederic Hungerford. The structure of the wool fiber. 1908. 475.
5. Dooley, William H. Textiles for commercial, industrial and domestic arts schools. 1914. 329 p.
6. Fales, Jane. Dressmaking. 1917. 508 p.
7. Gibbs, Charlotte Mitchell. Household textiles. 1912. 243 p.
8. Kinne, Helen and Cooley, Anna M. Shelter and clothing. 1913. 377 p.
9. Linen; how it grows and how it is made. National fiber company. 1900. 21 p.
10. Marsden, Richard. Cotton spinning. 1909. 361 p.
11. ——— Cotton weaving. 1895. 533 p.
12. Matthews, Joseph M. Textile fibers. 3d ed. 1913.
13. Nystrom, Paul Henry. Textiles. 1916. 335 p.
14. Shaw, Joseph T. From wool to cloth. 1904. 46 p.
15. Silk, its origin, culture and manufacture. Corticelli company.
16. U. S. Bureau of standards. Materials for the household. 1917. 259 p.
17. Woolman, Mrs. Mary S. and McGowan, Ellen Beers. Textiles. 1913. 428 p.

XIX. WOOLEN AND SILK GARMENTS.

A. BULLETINS.

1. Iowa state college of agriculture and mechanic arts. Ames. (Junior circular 45.)

B. BOOKS.

1. Baldt, Laura Irene. Clothing for women. 1916. 454 p.
2. Fales, Jane. Dressmaking. 1917. 508 p.

XX. EXTRA.

Department store merchandise manuals. 10 vols. The seven following are helpful for the home worker:

- v. 1. Jewelry department. 1917.
- v. 2. Leather goods department. 1917.
- v. 4. Cotton and linen department. 1917.
- v. 5. Notion department. 1917.
- v. 8. Millinery department. 1918.
- v. 9. Silk department. 1918.
- v. 10. House furnishing department. 1918.

PUBLICATIONS OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

Annual Report.

The Vocational Summary, published monthly by the Federal Board for Vocational Education (Vol. I, No. 1, May, 1918).

Bulletin No. 1. Statement of Policies.

***Bulletin No. 2. Training Conscripted Men for Service as Radio and Busser Operators in the United States Army (International Code).**

Bulletin No. 3. Emergency Training in Shipbuilding—Evening and Part-Time Classes for Shipyard Workers.

***Bulletin No. 4. Mechanical and Technical Training for Conscripted Men (Air Division, U. S. Signal Corps).**

Bulletin No. 5. (Reeducation Series, No. 1.) Vocational Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 166.)

Bulletin No. 6. (Reeducation Series, No. 2.) Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 167.)

***Bulletin No. 7. Emergency War Training for Motor-Truck Drivers and Chauffeurs.**

***Bulletin No. 8. Emergency War Training for Machine-Shop Occupations, Blacksmithing, Sheet-Metal Working, and Pipe Fitting.**

***Bulletin No. 9. Emergency War Training for Electricians, Telephone Repairmen, Linemen, and Cable Splicers.**

***Bulletin No. 10. Emergency War Training for Gas-Engine, Motor-Car, and Motor-Cycle Repairmen.**

***Bulletin No. 11. Emergency War Training for Oxy-Acetylene Welders.**

***Bulletin No. 12. Emergency War Training for Airplane Mechanics—Engine Repairmen, Wood workers, Riggers, and Sheet-Metal Workers.**

Bulletin No. 13. (Agricultural Series, No. 1.) Agricultural Education—Organization and Administration.

Bulletin No. 14. (Agricultural Series, No. 2.) Reference Material for Vocational Agricultural Instruction.

Bulletin No. 15. (Reeducation Series, No. 3.) The Evolution of National Systems of Vocational Reeducation for Disabled Soldiers and Sailors.

***Bulletin No. 16. Emergency War Training for Radio Mechanics and Radio Operators.**

Bulletin No. 17. (Trade and Industrial Series, No. 1.) Trade and Industrial Education—Organization and Administration.

Bulletin No. 18. (Trade and Industrial Series, No. 2.) Evening Industrial Schools.

Bulletin No. 19. (Trade and Industrial Series, No. 3.) Part-Time Trade and Industrial Education.

Bulletin No. 20. (Trade and Industrial Series, No. 4.) Buildings and Equipment for Schools and Classes in Trade and Industrial Subjects.

Bulletin No. 21. (Agricultural Series, No. 3.) The Home Project as a Phase of Vocational Agricultural Education.

Bulletin No. 22. (Commercial Education Series, No. 1.) Retail Selling.

Bulletin No. 23. (Home Economics Series, No. 1.) Clothing for the Family.

All communications should be addressed to

The Federal Board for Vocational Education, Washington, D. C.

* Emergency war training for conscripted and enlisted men.

BULLETIN No. 24

**COMMERCIAL EDUCATION
SERIES No. 2**

Vocational Education for Foreign Trade and Shipping

**ISSUED BY THE
FEDERAL BOARD FOR VOCATIONAL EDUCATION
WASHINGTON**

NOVEMBER, 1918

**WASHINGTON
GOVERNMENT PRINTING OFFICE
1918**

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FOREWORD.

Recent developments in the field of foreign commerce, and the practical certainty of the continued increase in our foreign trade after the war, emphasize the need of special training in order that American merchants may successfully compete with foreign merchants in expanding foreign trade.

To provide this technical education is the purpose, in its larger aspect, of the cooperative plans of the Federal Board for Vocational Education and the Bureau of Foreign and Domestic Commerce. This educational movement, initiated by this bulletin on Foreign Trade and Shipping, promises to be far-reaching in its effect.

The Federal Board represents directly the interests of those engaged in foreign trade education. Therefore, this bulletin is prepared to meet the needs of the teachers rather than of the producers by assembling, systematizing, and organizing literature of foreign trade with reference to the best methods for instruction on the technique and character of our foreign commerce from the point of view of foreign trade vocations.

The courses outlined in this bulletin are available for use not only in evening, part-time, and all-day classes under the direction of the Federal Board, but it is hoped that the commercial high schools and colleges and other institutions will freely avail themselves of any of this material which may be of use to them in carrying out their own program of instruction.

With a probable mercantile marine under the American flag of 25,000,000 tons, the question of shore operation, or management of ships for a profit, will be an important factor of American commercial life. This new merchant marine will make new demands on our consular offices, thereby increasing the necessity of technical training for efficiency in this service.

Thus in the aim and scope of this bulletin, the needs of the United States Shipping Board have been anticipated, as well as the requirements of the Bureau of Foreign and Domestic Commerce. These Government agencies have associated themselves with the Federal Board in outlining the general fundamental courses given in the bulletin, but more especially in the preparation of advanced courses

of study which are to follow. This plan includes, also, a manual of reading on foreign commerce and a collection of documents used in foreign trade.

The bulletin contains outlines of short unit courses in foreign trade technique on common selling methods and practices, the mechanism of foreign trade, exchange, credit and banking, ocean transportation, marine insurance, trade routes, foreign tariffs and commercial policies.

Specialized courses dealing with selected commercial areas are being developed for the benefit of students who have mastered the technique of foreign trade and have surveyed the condition of commerce as a whole. These courses will give each student a knowledge of trade and economic conditions and resources, and the language of some one particular region.

It will require the united efforts of individuals and organizations interested in this great field of American activity to make these present and future plans as complete and as practical as possible. This bulletin is only a first effort to make definite progress. The cooperation of all institutions, teachers, publishers, and authors and any others interested in foreign trade education is invited by the Federal Board. Only by this cooperation will subsequent bulletins prove of greatest value to those for whom they are prepared.

Acknowledgment is hereby made of the liberal use of outlines of tables of contents from private publications. Where Government publications covering the desired subject matter are not available as texts it has been necessary to draw upon some of the many excellent publications. It is inevitable in a new field of endeavor, such as the recommended courses of study, that the available literature will not be thoroughly known and that there will be phases of the subject inadequately covered to meet the particular demands of those courses, although many excellent works touch upon one or another side of the problem. The private publications drawn upon for material in planning the study outlines to which indebtedness is acknowledged are the following:

Courses 1 and 2.—Hough, B. Olney, "Practical Exporting."

Course 3.—Smith, J. Russel, "Industrial and Commercial Geography." (Henry Holt.)

Kaho, J. F., "Note Book for Constructive Work in Commercial Geography." (Historical Pub. Co.)

Goode, J. P., "Commercial Wall Maps." (Rand McNally.)

Course 4.—Escher, Franklin, "Foreign Exchange Explained." (Macmillan & Co.)

Withers, Hartley, "International Finance." (Dutton.)

Peddie, J. Taylor, "On Relation of Imports and Exports." (Longmans.)

Course 5.—I. Johnson and Huebner, "Principles of Ocean Transportation." (Appleton.)

II. Kirkaldy, Adam W., "British Shipping." (Dutton.)

III. Zimmerman, Erick, "Foreign Trade and Shipping." (Alexander Hamilton Institute.)

Hough, B. Olney, "Ocean Traffic and Trade." (La Salle.)

Smith, J. Russel, "Industrial and Commercial Geography." Part II. (Holt.)

Johnson, Emory R., "The Panama Canal and Commerce." (Appleton.)

Course 6.—MacElwee, R. S., "Ports and Terminal Facilities." (McGraw-Hill.)

Greene, Carlton, "Wharves and Piers." (McGraw-Hill.)

Clapp, Edwin J., "The Port of Boston," "The Port of Hamburg." (Yale.)

Course 7.—Selected Bibliography in Study Outline.

Course 8.—Government publications.

Course 9.—I. Day, Clive, "A History of Commerce." (Longmans.)

II. Herrick, Cheesman, "History of Commerce and Industry." (Macmillan & Co.)

The present bulletin is written and prepared by Dr. R. S. MacElwee, Federal agent for commercial education, in the Federal Board for Vocational Education, with the cooperation of the Chief of the Division of Research and the Assistant Director for Commercial Education. He brings to this task experience, covering a decade of practical business activity as salesman and executive in European countries of American business houses and a teaching experience in economics and foreign trade at Columbia University in New York. He is, therefore, able to view the problem, both from the standpoint of the man who must use it in selling American products overseas, and the teacher who must give the instruction which must be of practical value to men in such service.

C. A. PROSSER,
Director.

VOCATIONAL EDUCATION FOR FOREIGN TRADE AND SHIPPING.

AIM AND SCOPE OF THE BULLETIN.

This bulletin deals with that portion of the field of education for foreign trade designed to meet the requirements of those who must learn the practical aspects of the fundamentals of overseas commerce and shipping within a comparatively short time.

It intends to help point the way to a division of the field of foreign trade study to permit more intensive specialization. The courses herein outlined are intended to offer specific, practical, vocational training, in as far as possible, for definite positions.

Although it is hoped that the courses suggested and outlined herein will be suggestive of application to any kind of training in the basic principles of foreign trade and shipping the groups of students to which the bulletin makes particular appeal are the following:

I. People employed during the day in business houses and in contact with some of the problems of the subject matter, in evening classes.

II. Colleges, on a part-time basis or regular schedule (by expanding the outlines here suggested).

III. High-school seniors who are to be trained to be junior clerks in the export business and brought into practical contact with that business on a part-time arrangement.

IV. Engineers whose technical training must be supplemented by training in the essentials of the routine of foreign commerce in order to properly represent American interests abroad.

The large part of the bulletin will be concerned with the evening school group A.

Courses should be open to both men and women.

Further. The bulletin, by means of syllabi, will outline the several courses of general study in detail and with reading assignments to facilitate the organization and conduct of the courses.

The nature of the advanced courses, which will follow the courses herein outlined, will be only indicated. Advanced courses will be the subject matter of a future bulletin. The same applies to the details of language study. The choice of one or two of the 10 or 12 commercial languages of importance will be determined by later specialization by the student in some particular area.

The bulletin will form the basis for discussion and teaching at several centers during 1918-19. It will be reconstructed in the light of this experience for use during the teaching year 1919-20.

Therefore, frank discussion, reports of teaching experience, and practical requirements of business are earnestly solicited.

PRESENT IMPORTANCE OF EDUCATION FOR FOREIGN TRADE.

The time for Nation-wide interest in foreign trade is here.

With demobilization will come many great problems. Return to peace will not mean return to normal. The machinery to meet the new conditions of demobilization must be made now.

Without a merchant fleet before the war, reconstruction will find us in possession of an enormous tonnage of merchant ships, and the greatest yards in the history of shipping which must build more ships or cease to be. Men must be trained to manage and operate these ships. They must be filled with cargo or be a great national loss. The demands of battle-scarred Europe for reconstruction supplies will mean a large volume of freight for two or three years but what then? The new American merchant marine is at once both a danger and a great promise. It is a danger if ships and yards fall gradually to disuse and add their burden to the drag of reaction when war industries return to peace. It is a promise of American commercial prosperity if the ships and the yards are kept permanently busy carrying American and foreign wares along the highways of world commerce.

The men to hold this higher position for the United States and to carry out this logical development, must be trained now. They may be comparatively few in number until after the war, but these few will form the nucleus for creating a foreign trade organization. The few to be trained now must be ready to act immediately with the conclusion of peace, or great opportunities will be irreparably lost.

The present must be utilized to create the machinery, the skeleton organization, which will be expanded to meet the strain of peace. In no field to-day is the necessity greater than in American foreign trade and shipping, in time of war, to prepare for peace.

If the machinery is ready to train the men, without whom success is impossible, when the peace-time expansion of our overseas commerce begins there will doubtless be a large and new source of personnel of such importance that it deserves consideration. Thousands of officers and men will not only be without employment, but without desire to return to former vocations and professions. They will have acquired a restlessness, a love of adventure, an interest in strange

peoples and countries, a knowledge of foreign affairs and some knowledge of a foreign language which will make them the logical material for building up the nation's commercial overseas forces. To educate these ex-soldiers and sailors to quickly carry on the nation's commercial expansion and to readjust them to the new vocations in foreign trade will require a nation-wide educational organization. This organization must be at hand, in operation and capable of rapid expansion.

The career of an overseas representative of American business not only offers great opportunities for advancement but in the larger commercial centers is very pleasant. As American business branches have increased in importance and in number, in foreign trade centers, the social life has also increased in extent and variety. As Americans abroad have gained in social standing so also have they gained the business respect and social recognition both of the native residents of distinction and of their colleagues from the older commercial nations. Social life is a powerful business factor abroad. It is a means to an end and should be so considered in education and in merchandising.

When the knowledge of the chance of advancement and the pleasantness of the life as an American trade representative has become more general and with a taste of it from the American Expeditionary Forces' experience there should be much less difficulty in having American business abroad represented by Americans, instead of foreigners, as has been the case largely in the past.

It must not be overlooked that concerted effort will be necessary to educate many of our business houses to the greater efficiency from more intelligent treatment of their representatives especially in the Tropics, Far East, and backward countries of the globe. Such questions as housing, of tropical hygiene, and of other details which effect the morals, morale, and health of Americans abroad, must be the subject matter of research and instruction in this field. Aid in developing such instruction is earnestly solicited.

The importance of careful training for foreign trade has come to be generally conceded in the United States. There has been a recent change in the attitude toward this training and what it should be. This changed attitude is parallel with the changed attitude toward foreign trade itself. At the beginning of the European conflict, foreign trade was discovered many times each day by persons who had never thought of it before. There was much wild speculation in exporting. The lists of exporting concerns of various kinds increased by pages in the commercial directories. In recent months, since exporting has become very difficult and since many of the mushroom foreign trade firms have been weeded out, there has risen an entirely different attitude toward overseas commerce. In the place

of the opportunists of the get-rich-quick exporting, an attitude of careful study and constructive preparation for a permanent future has become manifest. Similarly the attitude towards foreign trade education has changed. In the first exporting enthusiasm in 1914, 1915, and 1916, there were many foreign trade courses given in various parts of the country by various men and institutions. These courses of study usually consisted of a lecture once a week, for 15 weeks, in which the entire world of resources and the entire field of exporting methods were covered in a most superficial manner, as could not possibly be otherwise.¹

These courses served their purpose. They did much to popularize the study of foreign trade as a vocation and as a national duty. These courses pointed out many of the topics which should receive consideration by commercial houses, intending to carry on an exporting business. They pointed the way without traveling it. The day of the few lectures, which superficially cover the whole world, has passed with the period from which they sprung. With the growing seriousness toward overseas commerce as a permanent vocation and as a national activity of vital importance has come the demand for specific and definite courses of study which will teach in detail *how to do* the many technical routine acts from filling out a bill of lading to planning a selling trip, or managing a line of ships.

TEACHING DIFFICULTIES.

There is a not unfounded feeling that to date there has not been great success in teaching foreign trade, except in the school of experience. Teachers and institutions have not been to blame for this, but a series of circumstances. With the infinite detail of international business routine and the great gaps in the literature on the subject, the preparation and teaching of courses on foreign trade is a difficult problem.

General courses in foreign trade have been given by two methods: (1) A series of separate lectures by various prominent business men interested in foreign trade. (2) A general course by some teacher of commercial or economic subjects.

Of the two, the first has given the more publicity to the course, but the second has usually given better teaching. There are two horns to the dilemma. The practical man, as a rule, is a poor teacher and the teacher is usually lacking in contact with the practical problems. In the "prominent lecturer" method, unless the lecturer takes time to write out his lectures and submit them to the teacher in charge of the course there is much repetition of general informa-

¹ There have been many scattered courses in and out of college which have been excellent single units in many instances; in particular a certain correspondence school series of twelve books gives a good foundation for future study and further specialization.

tion and a lack of continuity. The true value of the practical man called to talk about his work can be realized only when the students are advanced enough to need no generalization and are sufficiently well grounded to understand the detailed and specific, technical discussion of some very narrow and specialized problem with which the guest is particularly familiar. When the practical man talks about his own work he makes a valuable contribution to the knowledge of the subject, but when he generalizes, often outside his field, he adds little that is new, and often presents even the commonplace generalities inadequately.

Eventually there will be developed the teacher out of the field itself, just as has been the case in accountancy and other commercial or scientific subjects, in engineering and elsewhere.

Teachers who have tried to give a course in foreign trade have suffered from other serious limitations, in addition to a lack of actual foreign trade experience. Those few who have been at all successful have found it necessary during vacation to devote months to research and study. Such summer work is not only irksome, but means the sacrifice of valuable time taken from the teacher's "regular" courses in economics, marketing or whatever he is being paid his salary by the school or university to teach. Also, to many teachers of economic or business subjects the summer vacation is the only time to do outside remunerative work. The difficulty, the expense and the amount of time required to prepare a course of lectures dealing with a new subject which covers a broad, undefined field with few, if any, standard texts and an almost limitless mass of scattered literature, must be experienced to be appreciated.

Even where the foreign trade teacher has had practical experience in the business overseas, the problem of presenting a good course is amazingly difficult. To collect his own experience from his own activity into a course of lectures is not easy. When this purely subjective product has been written it will only cover a small part of the world's trade and only the industries with which the individual in question has had personal experience. The result is a monograph, very valuable in itself, but not a general course. Some day foreign trade education, at our larger institutions, may have sufficient financial backing to support a staff of specialists who give such monograph courses on specific subjects with which the teacher has had personal contact. Government publications, such as the special agents' series of the Bureau of Foreign and Domestic Commerce, are serving for this kind of monograph teaching by collecting the materials and furnishing the text.

Even if the teacher of foreign trade has a fair amount of leisure in which to develop his courses, the difficulty of collecting material is very great.

Even our libraries have no adequate "foreign trade" subject file. No less an institution than the Economics Room of the New York Public Library attempted to make a subject catalogue, but the work fell apart of its own weight. The lines are too difficult to draw closely. If not drawn closely, foreign trade, directly or indirectly, embraces the entire field of human activities. Religion, philosophy, ethnology, geology and every other science has some connection with the production or consumption of wealth. The work of the Bureau of Education, in collecting a selected bibliography of foreign trade and offer surveys and research, is a step forward.¹ To make general reading and study possible, public libraries and in particular university libraries should collect on one set of shelves, and easily accessible, the most important publications on foreign trade.

Unfortunately there is very little literature dealing with those very specific and practical operations which it is most necessary for Americans to learn *to do*. There are great gaps which can only be filled as the science develops and those men of practical experience and theoretical inclination put on paper the results of study, research, and experience.

This bulletin may reveal some of the fields of detailed study where texts and dissertations are lacking.

The Bureau of Foreign and Domestic Commerce has files of letters from teachers pleading for help in the preparation of courses. This Government office is generous with its own publications, but has not the time nor the staff (and possibly not the function) to do more than aid by furnishing what publications are in its power, making known the principal foreign publications that are promptly forwarded to it from abroad, and supplying occasional lecturers. It can not work out the supplicant's courses in detail for him though it has given much advice and prepared tentative study outlines. After all, the Bureau of Foreign and Domestic Commerce is chiefly concerned with more direct relations with the business men.

Supplied with many volumes of "raw materials" for foreign-trade study, the teacher is still confronted with the two questions of "what to teach," and how to find the time to work over the great mass of raw materials and shape them into courses. A bibliography of all the published works on foreign trade and shipping will save part of the work, but is very far from making a course or series of courses to put before a group of students.

It is therefore firmly believed that the Federal Board, in cooperation with the Bureau of Foreign and Domestic Commerce and with the United States Shipping Board can do much to aid foreign-trade instruction by utilizing its advantage of positions to secure informa-

¹Also see Shuey, Dr. Herbert Stanley, "Bibliography of Foreign Trade Publications." San Francisco, Cal., The Ten Bosch Co., 1918.

tion and other materials for teaching foreign-trade subjects and by supporting a corps of experts in this field to plan the courses and arrange the materials. For the selection of texts from private authors and publishers in the attached outlines the author of this bulletin assumes personal and individual responsibility. With the courses thus prepared, it will be no hardship for experienced teachers of commercial and economic subjects to carry the courses, although not specialists in foreign trade or shipping.

With reference to the study outline of courses offered in this bulletin it must not be understood that these "tabloid" courses of the "add water and serve" principle, will rob the teacher or institution of initiative and individuality. There will be ample opportunity for every teacher to use all his own resourcefulness in presenting these materials and, by adding his own, to improve and enlarge the same. By frank discussion and a pooling of experiences on the part of all teachers of foreign-trade subjects, progress will surely come which will be of value to individual teachers, to institutions, and to American commerce.

SUBDIVISION OF THE SUBJECT MATTER.

The general subject of education for overseas commerce can not develop until there is a division of subject matter into specific fields, small enough to enable the detailed treatment of specialization. This subdividing is now in progress by natural evolution, although, as in the case of political economy, the process of specialization may continue over a long period of years. The continued subdivision of science into specialized fields of study and research can only take place as the science advances and the store of knowledge increases in amount, order, and precision.

It is conceded that the first methods to teach foreign trade have been lacking of conspicuous success. The trouble or analysis will be found in the unfenced expanse of the field itself. The teacher problem will gradually be solved with the subdivision of the subject matter. A publisher asked an author recently, "Won't you write a book for us on foreign trade?" He replied: "I might write a book for you on engineering, too." The time has long since past when a book on the general subject of foreign trade is any more possible than a book on the general subject of engineering. Only with the advance in specialization will foreign-trade writing and teaching become a scientific field comparing with engineering.

There will be several lines of division—first, as to methods in general, such as document technique, export, marketing, etc., and, second, as to geographical areas, such as the Levant, the Far East, or the River Plate States, together with a very intensive training in the practical use of the chief language of the area.

This division of the subject matter, as it presents itself at present, suggests a curriculum covering two years. The first year will lay the general technical foundation which underlies all foreign trade and shipping. A subsequent intensive study of a particular geographical area, with its language, will be securely built upon this firm base.

ADVANCED COURSES IN SHIPPING.

Such students as are intending to engage in the shipping business will specialize in such detailed vocational studies as are grouped under the general caption of "Shore operation." This includes ship's documents and papers, shipping law, admiralty law, stevedoring and cargo landing, general shipbuilding, elements of navigation, ship financing, advanced marine insurance and bottomry, etc.; also languages as the nature of the company may require. Such courses worked out in detail will be the subject matter of a later bulletin.

As to the technique of foreign trade there are several subdivisions which are already evident. The more important of these subjects should be studied during the first one or two terms. This would be the first winter's work. These are the courses which are outlined and presented with this bulletin for immediate application (see pp. 44 to 46).

ADVANCED COURSES GROUPED ACCORDING TO COMMERCIAL AREAS.

[Selected with regard to the part of the world of commercial interest to the student.]

The following geographical divisions of the world's commerce is made according to considerations of language, transportation, political control, similarity of laws, etc. Note that this geographical division of the world from the point of view of overseas commerce has little in common with the old continental division of the globe with which we are familiar from our school geographies. On a moment's reflection, such a formal division will appear in all its absurdity from the commercial viewpoint. The greatest single factor in the practical division is transportation. The groups are the fewest in number commensurate with study in detail or the ability of a foreign resident general manager to cover from any one office. In each study group below the local language, when important, is noted in parentheses. In some cases, also, the probable headquarters of the resident general manager is added.

It is to be understood that the resident general manager of the American business house will be located in one city of the greatest importance and will work out from there. He should know the key language well and learn as rapidly as possible the subordinate and related languages in his area.

In the study of a particular commercial area, the most important country and language should be taken up in detail, then the lesser countries of the area associated with it.

The subdivisions of the world's commerce by areas may follow an outline similar to the following. This list is given here to indicate the size and difficulty which will be incurred in attempting to collect the materials necessary to make a complete set of courses covering each group, and to plead for assistance from all persons interested. It is not expected that a student study more than one group. However, he may continue his study group by group and year by year.

ENGLISH GROUP.

Area.

- I. United Kingdom (London).
- II. Union of South Africa (Johannesburg).
- III. British India and adjacent colonies (Calcutta) (Bombay); Ceylon; Straits Settlements (Singapore) (Dutch); Indo-China (Siam) (French).
- IV. Australia (Melbourne) (Sydney).
New Zealand.

FRENCH GROUP.

- V. France (Paris) (French language).
Belgium (French).
Switzerland (French).
Morocco, Algeria (Tripoli) (French).
Italy (Italian, in limited circles French).
Spain (Spanish, in limited circles French).
Portugal (Portuguese, in limited circles French).
- VI. Levant and Near East (commercial language, French).
Greece (Saloniki, headquarters for the other Balkans).
Balkans—Bulgaria, Serbia, Roumania, Montenegro, including Turkey.
Asia Minor.

FAR EAST.

- VII. (a) China (Shanghai) (Hongkong).
(b) Japan (Nagasaki), Korea.
(c) Philippines (English, Spanish).

LATIN AMERICA.

- VIII. Caribbean and West Indies:
Mexico (Spanish).
Central America (Spanish).
Cuba and West Indies, Antilles (Spanish, English, French, Danish).
North Coast of South America (Spanish, French, Dutch, English).
Colombia (Spanish).
Venezuela (Spanish).
- IX. Brazil (Portuguese) (Rio de Janeiro).

X. River Plate States (Spanish). (Headquarters Montevideo or Buenos Aires).

Argentine.

Uruguay.

Paraguay.

XI. West coast (Spanish).

Chile (Valparaiso).

Bolivia.

Peru.

Ecuador.

XII. Russia (Moscow or Petrograd) (Russian), including Poland, Siberia (Omsk, Vladivostok).

GERMANIC GROUP.

XIII. Germany (Hamburg, Berlin or Copenhagen) (German and Danish).

Austria-Hungary (German).

Holland (Dutch).

XIV. Scandinavia :

Norway (Christiania) (Norwegian).

Denmark (Copenhagen) (Danish).

Sweden (Stockholm) (Swedish).

Finland (Finnish).

There are some 10 or 12 commercial languages of importance. The selection of the most important is therefore difficult. To begin with, the basic or cultural language which should be studied in school is French. French is not only the popular language at present, but "la langue diplomatique," which is usually used in international conventions. Anyone entering the consular or diplomatic service, or representing American commissions as a delegate to an international conference, must be able to speak and understand the spoken word in French. In the past we have studied French in our high schools and colleges, but not as a living thing.

There are two points of view in approaching the study of the French language. There is the old, scholastic method of studying it as one of the cultural subjects. What counts in foreign commerce is proficiency in the use of the French language. Only when the pupil is able to converse freely and write a respectable business or social letter in French will the language be of value to him in foreign service. From the commercial standpoint French is the language of France, Belgium, Switzerland, all the north of Africa, except Egypt, the Balkan States, the Near East, and can be used extensively in Russia, Spain, and with the better classes in all of Latin America and Italy. To learn to use French requires intensive training of the ear. A language must be learned by phrases, not detached words, and those phrases must ring in the ear. This is only possible by hearing it spoken correctly.

Also, having once acquired a foundation in French, as here outlined, in addition to the cultural teaching of the subject, it is not a difficult matter to learn Spanish, Portuguese, or Italian.

Spanish and Portuguese are our next important languages from the viewpoint of our commercial and foreign relations at the present time. The same idea in teaching Spanish and Portuguese applies. Namely, to be of any good at all as a language for foreign service it must be spoken and understood and also written idiomatically in correspondence.

Russian should be a great language for the future. The volume of our Russian trade should be many times that of the entire trade with South America. This statement is based on the population and purchasing power of the country. Peace and order must be restored in Russia some time, and when this time comes, we must be prepared to send representatives to this enormous and rich country to represent American interests.

Chinese and Japanese are languages which we must also teach in the future in our higher commercial schools. The future importance of the German language and the Germanic languages associated with them, such as Norwegian, Swedish, and Dutch, is undeterminable at the present time.

It must be repeated that a language to be of value must be spoken, understood, and written well enough to make idiomatic social and business letters according to the best form and usage of the country.

To accomplish this our larger centers of commerce must eventually establish schools of modern languages, some 10 or 12 in number. (Since this bulletin was first drafted news came from London that the British Board of Trade in a special committee advocates language schools on similar lines to the one here recommended.)

A later bulletin will endeavor to offer study plans for separate groups of courses corresponding to each geographical area with particular emphasis on the acquisition of conversational and letter-writing proficiency in the important language of the group.

SUBDIVISION OF THE STUDENT BODY.

There is another division of the field or specialization according to the character of the students, their age, and their present occupation.

Experience has shown that to have vocational teaching fulfill its aims it must fit specific persons to do specific things. It must train a person for a particular job. Although there has hardly been a beginning made in the analysis of the requirements of exporting houses, yet there are several groups of students and two fields of service. The object of the study may be to fit the student (a) for

home duty, (b) for overseas duty. The students may be of the following categories:

I. *Employees, owners, or executives.*—The employees, owners, or executives of banks, export departments, shippers, freight forwarders, steamship operators, etc. Those engaged in some form of the exporting or shipping business at home or abroad or those in some other business who wish to enter such business. In this category may be enumerated:

(1) Clerks, department heads, and junior officers who must learn to do the routine and technic of daily duties of exporting.

(2) Export managers and candidates for promotion to this position, who lack knowledge of technical detail, which must be supplied even if it be not a part of the daily work.

(3) Executive or owners of firms doing or intending to do a foreign business, who wish to be well informed on all phases of the general subject as well as specific routine.

(4) Finally, there is the man who is to be sent overseas by the firm and must prepare for actual foreign field service within a few months.

II. *College students.*—There are the students in college who wish to enter foreign trade. In contrast to the preceding group the college student usually lacks contact with business affairs, both domestic and foreign. After leaving college he must spend some time in business before he is sent abroad. The study of foreign trade by college students is a field in itself with its own peculiar problems.

III. *High-school pupils.*—Of high-school pupils only a small per cent are able to go to college. When they enter an exporting house, they are not likely to be sent abroad for several years. These pupils wish to fit themselves to earn a living as clerks in commercial houses having overseas business. Not neglecting the broad foundation, the object of the training of this group must be strictly vocational. They will learn to do, with understanding and dispatch, certain very definite tasks. *We must train clerks who will not remain clerks.*

IV. *Engineers and technical men.*—The American manufacturer and merchant selling technical products is coming to settle upon the requirement that the foreign representative be a highly trained engineer. For instance, such lines as railroad construction contracts, railroad equipment, power plants, telephone plants, electric street-car systems, bridge and harbor works, elevators, radiators, heating systems, and so forth, require salesmen to represent them who are not only trained in foreign trade, but are also engineers. Just as the foreign salesman of such engineering products who does not know engineering will be almost hopelessly handicapped, so also the engineer who knows nothing of the technique of foreign trade.

The leading technical schools should offer a group of foreign-trade courses in addition to some fundamental business courses. Technical men should be urged at least to take the extension courses outlined in this bulletin. One of the most serious handicaps of the technical man is his lack of familiarity with business practice and routine.

EACH GROUP REQUIRES PARTICULAR HANDLING.

All four groups are important. The consensus of experience is that the different groups require different handling. For instance, experience has demonstrated that it does not show satisfactory results to give a college extension course with the study group made up of people out of business houses and college students who have no contact with the practical difficulties which confront the man from business.¹ The person in practical contact with the subject matter has many peculiar problems he desires explained in detail. Even with the study material divided into many specific fields, the time in which to cover the mass of material is very limited in extension classes. Much knowledge on the part of the student group must be taken for granted and only those points discussed which are new to the group. It usually happens in a mixed group that the students out of business houses are able to hurry over much that they know in order to gain specific information regarding problems which pass over their desks every day in the business. The detailed and specific discussion desired by the business student is often unintelligible to the full-time college student and of no particular interest to him. On the other hand, the general discussion for the college student's instruction seems elementary, impractical, and unsatisfying to the business student. The two groups of students do not mix well in extension classes as usually conducted.

Also, in the presentation of subject matter to conform to the needs and the age of the high-school senior, in view of the position in the business organization which, at his age and experience he will be likely to fill, it seems necessary to arrange courses in the various phases of foreign trade to apply to these peculiar needs. The high-school senior and also the college student have more ground to cover because of their lack of contact with business, but in a less intensively practical way than the young man in the business who wishes to qualify for a desk higher up. Also the full-time college student has more time at his disposal. It is evident that the man in business all day until 5 or 6 o'clock, has little energy or time left for extensive reading and independent study. This little time at his disposal

¹ This does not mean that extension classes are inferior in quality to the regular college courses or that they should not be given college credit.

must be used in gaining the maximum information of value to him in his daily work.

The first object of this bulletin is to outline such short, extensive and practical courses as will give the groups above a maximum amount of knowledge applied to the needs of business.

THE POSITION OF FOREIGN TRADE AND SHIPPING IN COMMERCIAL EDUCATION.

Education for foreign trade is a subdivision of commercial education and should not be considered as something apart. The study of overseas commerce is a higher specialization which follows a thorough grounding in domestic practice. Domestic commerce, studied in business schools or in the school of experience, is a prerequisite to a study of foreign commerce. It is obvious that there will be little advantage from a study of foreign credits and exchange without having first studied or learned from experience in banking and business as much as possible about economics, banking, and money. Also, to understand the document technique of exporting, domestic commercial practice, accounting, business administration, and similar subjects must be quite familiar to the student. Marketing and salesmanship at home is an obvious prerequisite to the study of exporting methods and foreign selling. It is unnecessary to carry the parallel farther. Doubtless some of the courses recommended in this bulletin could be included in the courses of commerce in general. However, the chances at the present stage of commercial education are against the student having had those studies at all or at least, not from the foreign trade point of view, therefore they are included here.

The class of students with which the bulletin is most concerned has gained a commercial education in the school of experience, in educational institutions, or in both. Men in business who wish to learn more about foreign trade may or may not have attended high school or college, they may or may not have taken commercial courses in high school or college or in the private "business college." But they should have gained a practical grasp of domestic business as a most acceptable prerequisite for foreign trade study. If their knowledge of domestic commerce is deficient, it should be made up at one of the many commercial schools of all grades before attempting to study foreign commerce.

Granted the proposition that overseas commerce is a higher specialization in commercial education at home, the logical place of foreign trade study in a study program or curriculum of general commercial education is after the other subjects. Therefore, courses on foreign trade should not be scattered through the curriculum of general commercial education, but should be grouped together as

additional work after the general commercial study has been completed. Not one or two courses, but groups of several courses necessary to cover the wide field of overseas commerce should form a specialization requiring at least two years' study. Reasons for preferring the group of short courses, rather than long or scattered courses, will be set forth below.

I. The high school of commerce curriculum should be so arranged that the senior year remains free for specialization. If this specialization be foreign trade the group of short, practical courses, outlined in this bulletin for the first year of general study, should be adapted to the age of the pupil and the needs of the business community. An additional year of advanced work in special commercial areas seems scarcely advisable for the high-school pupil at the present state of development.

II. In a college curriculum of business training the place for foreign trade study is after foundational commercial studies have been completed. The senior year is the time to specialize when the student has arrived at a place where he may be able to make a definite choice of the field of commerce which he intends to enter on graduation or may have in view a definite position with a business house engaged in exporting. For the college student a graduate year of further specialization in some particular commercial area of the world, such as Russia or the west coast of South America, would be the logical sequence.

Most of our university schools of business are of graduate or upper class and graduate grade. The relative position of foreign trade in such a curriculum would be the same. Graduate or under graduate, it would come after the general commercial work.

The first point to repeat is, that foreign trade study is an advanced specialization following a thorough study of domestic commerce. There is another and very practical side of this question, that a decision to enter the foreign-trade field of business or the opportunity to do so, as a rule, can not be reached early. When the decision or opportunity is possible, the necessary training must be short, specific, and intensive. It can not be long drawn out.

It must be kept in mind that the demand for men in foreign trade is only a small fraction of the total commercial demand. Education for foreign trade will therefore not reach the great mass of commercial students.

SOME REASONS FOR SHORT UNIT COURSES.

The prerequisite of the short unit courses is the division of the subject matter into subtopics capable of unit treatment. It is then possible to focus the attention on a subject and study it in detail.

The only study which will be of value in practice is a study in detail. It must be ~~ever~~ borne in mind that the object of the study is to learn to do something of economic value. To do anything requires a knowledge in detail. It is necessary to know the subject, not simply to know about it.

It is evident, that with widely, varied education and experience no two individuals have the same preparation. It will be of advantage to many to be able to make up deficiencies by studying special subjects without the necessity of covering much familiar ground.

In general, within the next few years, the demand for trained men for exporting departments, or to go abroad for the firm will far exceed the supply. Eventually, the university schools of business will turn out graduates with training, looking to foreign trade as a vocation. These young college graduates will come well equipped with general knowledge and a superior mental discipline to rise rapidly in a commercial house doing overseas business, if they have it in them. College-trained foreign traders should be the true ambassadors of commerce. However, it will be a decade before such men will become effective in noticeable numbers. In the meantime there must be provided means for thoroughly and efficiently training men already schooled in business to be more useful in the immediate effort to gain and hold foreign markets so vital to our national welfare.

Furthermore, the field of foreign trading will never be entirely preempted by the university graduate. He will be only one source of personnel. Many men will rise from the ranks in the future, as in the past, and these men must be afforded an opportunity of foreign trade study in specific and detailed information. Such study, to be of value, must be concentrated and not extend over a long period of time.

The man whom the firm usually wishes to send abroad is one who has made good in the business at home, because of his intimate knowledge of the firm's intricate machines and its business policy. Often the call could not have been foreseen. To qualify to enter on the foreign mission within the near future will require much intensive study of the various phases of the new position. Such a man, in contact with actual foreign trade activity, is the one the Nation desires well prepared to creditably represent American business.

To accomplish this in such cases the foreign trade training centers of the future may find it necessary to repeat the important courses two or three times each year as well as to maintain instruction in the details concerning various commercial areas. The established foreign-trade school of the future will need to be an all-year-round school, with three or four terms and frequent repetition of the most important courses.

Short courses do not mean superficial courses. On the contrary, the curriculum of intensive and specific practical courses should give the most thorough training possible. The study program of several short courses should be a well-organized system of training, giving a wide range of study and careful specialization.

Neither should the short courses be thought of as purely emergency training as contrasted with a system of training for foreign trade which will extend over many years. In the final analysis those who actually need foreign-trade training need it in an emergency. Paradoxical as it may sound, training for foreign trade is a permanent emergency. The national need for training to fill positions in the great business of overseas commerce is of the greatest permanence. The machinery for this phase of vocational training is intricate and elaborate. It can not be hurriedly constructed for a season or for the existing emergency and then be wrecked like the architectural creations of a world's fair. On the other hand, the personal need of each individual who enters a branch of commerce connected with foreign trade is an emergency need.

It is at variance with the rules of mathematics to believe that the chance or probability that the boys or girls who start out to learn foreign trade when they go to high school will be the same men and women who, out of all the millions of the Nation's commercial personnel, are the very ones to be export managers or foreign representatives. The process of elimination and selection for this rather small number of persons out of the total millions who carry on the Nation's business involves too many other factors of personality, ability, aptitude, and circumstances. The usual experience for those who have been in the foreign-trade field or engaged in exporting has been that the need for specific training confronts a person rather suddenly through force of unforeseen circumstances. These circumstances may be individual or may be due to a change of conditions due to wars, panics, tariff legislation at home or abroad, et al. A school of foreign trade and shipping must be ever on the alert to put in new unit courses to meet a sudden need. It is then necessary to learn quickly how to do the work in hand and to do it well.

Therefore, training for foreign trade is a permanent emergency from the purely vocational aspect. From the viewpoint of the academic curriculum it is subject for advanced specialization.

Those are some of the reasons why, in this bulletin, the study of foreign trade is presented in groups of short, intensive, practical unit courses.

COOPERATIVE PLANS FOR TEACHING FOREIGN TRADE.

I. EVENING SCHOOL FOR FOREIGN TRADE.

It was stated that the courses herein outlined are intended to reach two groups of students, those engaged in business and those who are still in school.

In order to teach those in the employ of firms interested in exporting, it is obvious that a close relationship must be brought about between our educational institutions and the business community. It is the desire and interest of the Federal Board for Vocational Education, the Department of Commerce, Bureau of Foreign and Domestic Commerce, and the United States Shipping Board not only to cooperate in this work in Washington but through their various connections to encourage their respective affiliated institutions to found educational courses in foreign trade and shipping in those commercial centers where such schools are likely to be of practical value to the business community. It is to be added that such an organization as an evening school for foreign trade and shipping is only possible where there is an active interest on the part of the business community.

SUGGESTION—HOW TO ORGANIZE A CHAMBER OF COMMERCE EVENING SCHOOL FOR FOREIGN TRADE.

Under the auspices of the regional office of the Federal Board for Vocational Education, the district office of the Bureau of Foreign and Domestic Commerce, the representative of the United States Shipping Board, and the foreign trade committee of the chamber of commerce of any particular city should call together a few of the merchants who are most interested in foreign trade in conference with the superintendent of schools and representatives from the high school of commerce and the nearest college or university. These should organize an educational committee, not to meet and adjourn, but to immediately begin the work of establishing these courses.

The spokesman from the university and the superintendent of schools should find the teachers who could satisfactorily conduct the courses and adopt the same to the local needs of the community.

A fund sufficient to guarantee the financial backing of the courses should be subscribed by the interested merchants, the chamber of commerce, or other interested sources. This fund need be no more than a guarantee. The courses should carry themselves financially from the fees. The students who take the courses should pay for what they get. It is to their own personal advantage and not alone to the advantage of the business house for which they are

working. The tuition should not be more than \$10 or less than \$5 a course for the year. The tuition fees should carry the course.

The business houses should agree with the committee to insist upon it that those of their employees, whom they consider good material or whom they believe are in need of the particular training which these courses are to give, should take the courses. It will mean an entirely different atmosphere in the study of the foreign-trade subject if the students are designated by the heads of the house out of the business to study foreign trade as part of their work for the firm and their hope of advancement. Attendance at the meetings and the quality of the work done by the employee would be a matter of report to the business house at least every five weeks.

If the employer is interested in improving the education of his employees and is satisfied with the result which the employees attain upon satisfactory completion of the course, he may refund, in whole or in part, to the employee the tuition fee which he has paid, as a special bonus. The only reason the student should have his tuition refunded is the fact that he has attended the course faithfully and intelligently from beginning to end.

The teaching staff will probably be drawn from the universities or high schools of commerce. There should be no fixed rule to this, but the advice of the universities, best suited to help in this work, is of importance in the actual execution of the teaching.

Costs.—It is not expected that teachers will carry on this work as part of their regular salaries from the university. This has not been the custom in the past in extension teaching. Universities pay from \$200 to \$300, usually \$250 for one semester of 15 weeks. That is to say, one of the courses as herein set forth would cost for teaching staff \$250 for each term and course. This seems to be fair when reviewed from the standpoint of the value to the exporting community. With the courses already outlined in the bulletin, it is a reasonable remuneration to the teacher, although this would be too little to pay an expert for an original course. The teaching cost for four courses would therefore be \$1,000, exclusive of light, heat, and housing.

At a minimum tuition fee of \$5 the course, or \$20 for each student, it would require 50 students in each course to carry the instruction of four courses. It will be seen that the financial obligation of carry-out the study plan is not a serious one. With such an organization any exporting or shipping community can organize a school to meet its own requirements.

Housing.—It will depend on circumstances whether the chamber of commerce or the university, or some member who happens to have adequate offices, will take care of the housing of the course. The

location is an important feature. There must not be a great loss of time for the student in getting from his work to the school. There must be adequate desk or table room for the document and map work. There must be good light and ventilation. If possible, there should be regular seat assignments and a sketch plan of the same to enable a rapid checking of attendance.

OTHER MEDIUMS FOR FOREIGN-TRADE EDUCATION.

It is not intended to infer that the mediums suggested in this bulletin are the only schools recommended. On the contrary, any educational institution which is in a position to take a curriculum, as here outlined, and carry it through or improve upon it, is a great addition in the field of foreign-trade education.

There are several excellent institutions which should be interested in giving foreign-trade courses. It is necessary to offer an opportunity to any person to study foreign trade and shipping, who is inclined to do so, no matter what his present occupation may be. It is also necessary to encourage foreign-trade education wherever there seems to be a need for it. Such general education on these subjects is greatly desired by both the Department of Commerce and the Shipping Board.

Y. M. C. A.—For instance, in the reeducation of returned members of the American Expeditionary Forces the influence of the Y. M. C. A. will be of great importance.

University extension.—There are the university extension courses and evening courses of various colleges and universities. As has been mentioned elsewhere, such night-school instruction must vary considerably from the method of teaching the same to regular students at the university. The night courses, as conducted by a university and for the benefit of those persons who are engaged during the day in commercial vocations are in no sense different from the courses as herein outlined.

It is certainly not the time for any duplication of effort when the strength and resources of all parts of the nation's life are taxed to the utmost.

In any city where there are several colleges and universities it is earnestly desired that they cooperate with one another as well as with the superintendent of schools, the chamber of commerce, and interested Government agencies. If a university does not desire to cooperate, but desires to give its own courses, that is an affair of the university and should not be made a matter of discord. However, our national tendency to unnecessary duplication would be emphasized here, as unfortunately is the case in many other fields of endeavor. It is therefore earnestly recommended that the evening

classes in foreign-trade should be the joint problem of all the institutions of learning in a city and the commercial interest of that city.

Correspondence schools.—There is a great and good work to be accomplished by the correspondence extension school. Many individuals or small groups can be reached by correspondence and home reading who are not situated advantageously to attend resident classes. This is particularly true of executives, men who travel a great deal, or smaller communities which could not support a staff of teachers for resident instruction. Efforts to reach these scattered individuals and offer them the opportunity of improving themselves in the knowledge of foreign trade, shipping, or Government service are most commendable.

The private business college.—There are also several very excellent private commercial schools. The so-called "business college," in many cases, has attained a high state of perfection as an educational institution. These business colleges, schools of accounting, or whatever they may be called, serve a most useful function in the field of vocational commercial education. An institution which trains certified public accountants in evening courses lasting two to three years, could very well put in a set of courses on foreign trade to enable accounting students to specialize for foreign trade. Many foreign-branch managers of great American firms have come up through the auditing department. Many of the students at these schools are college graduates who find it necessary to add to their academic schooling a purely vocational study. It is therefore to be recommended that these private institutions of commercial education which are interested or believe that they have a field in which to work should organize and carry through courses similar to those herein outlined.

Continuation schools.—There are also schools or other private institutions which would serve the younger employee who has not been able to continue his studies through high school and is making up his commercial education by evening work. The courses as outlined for the high schools would be adapted to this class of students in private evening schools.

Trade associations.—There are also educational institutions, maintained by associated trades or professions of the nature of the evening courses of the American Institute of Banking. Such an organization should offer to the members of the institute, who have completed the other courses in economics, mental arithmetic, accountancy, etc., an advanced course in foreign trade. In this case it would be necessary to put considerable stress on the course of foreign exchange and banking. This does not mean that the basic courses herein outlined are less important. It is the advanced specialization which differs as the

particular case may require. This, it will be seen, is only a logical development of training the man for the job. Perhaps there is no clearer illustration of specialization in the field of foreign trade than the possibilities of the American Institute of Banking developing special foreign-trade courses that will improve the knowledge and efficiency of the foreign-trade departments of member banks. Such schools, as above, should go far in "training men to order," and in "teaching what the business man wants."

It is always the desire of the Federal Board for Vocational Education to assist in every possible way in mapping out the proper courses for each specific foreign-trade activity and by its field work to aid and assist in carrying them through.

II. PART-TIME AND COOPERATIVE PLANS FOR HIGH-SCHOOL PUPILS.

As indicated above, there is a low mathematical probability that a student who has simply taken some foreign-trade studies in the course of his high-school or college training will become connected with a house engaged in foreign trade. At present, when hunting a position with a house with a foreign department, having taken some courses may be a talking point, but as a rule the employers have little inclination to give much weight to this fact. The employers testify that the applicant is not particularly benefited by the courses as have been given to date. He therefore has the inclination to judge the candidate on his general make-up, his intelligence, his personality, and alertness of mind, and disregards what the candidate may say about his having taken a course in foreign trade. The employer finds that the alert young man will qualify in his business and do a particular task in his business the way the employer wants it done, and there is no advantage in having had a general course outside. This is doubtless an extreme attitude, but, unfortunately, the attitude is quite prevalent among employers. The obvious conclusion is that, if the education for foreign trade is to be of any value whatsoever, it must train for a specific position and as far as possible train men who are already in contact with the business, either through present employment or the promise of a position upon completion of the course. Without the contact between the pupil and the job, the few who take courses in foreign trade will be lost in the millions of pupils in general commercial education, and the business houses doing foreign trade will have no particular interest in hunting out these few pupils who may have taken foreign-trade courses.

The real problem of "contact with the job" is in connection with the high-school (or college) students. It is generally appreciated that the prime factor in commercial education, as in other vocational

education, is the contact with the actual conditions which the student will meet after leaving school, maintained while the student is still in school. The question of part-time work as applied to commercial education is somewhat more difficult than that worked out by the University of Cincinnati. There the mechanical-arts students work in pairs, alternating on the machine one week and in college the other week. On Saturdays the two work together, so that one may pick up the work in hand where the other left off. There is no serious obstacle to the establishment of a similar cooperative arrangement between a high school of commerce giving a senior-year training in foreign commerce and the foreign department of a business house. There is admittedly more difficulty in picking up the work where the other of the team left off in commercial work than in machine-shop work. These difficulties are not at all insurmountable where there is a desire to do so. It is urged that sincere effort be made to establish such part-time work by teams.

An alternative suggestion is this: Business houses which require 10, 15, 20, or more junior clerks every year to work into their business will make a choice of several promising pupils at the end of their junior year of the commercial high-school course. These students will be employed under a written agreement as messengers or junior clerks in the business during the summer following junior year and perhaps during vacations or holidays during the entire year. The hours of work will vary with each house and with the rush seasons of the house.

With the very definite object of becoming a regular employee of a particular house, and with the feeling of responsibility of being under contract (see suggested contract p. 33), the pupil will have quite a different interest in the school work. He will be able to learn from the general school study those particular items of information which apply to his particular business. It is trite to state that the practical daily routine of a business is not a thorough teacher. The employee only sees one or a few processes of the business, only handles a few documents, and never does learn many things just outside his daily routine which he should know in order to do his own work more intelligently. The employer will have the advantage that the candidates thus chosen by him in the junior year will have a training with a view of entering his particular business and his training, though still lacking in many peculiar details, will be of a broader and deeper character than he possibly could give the candidate in the same length of time. Also there will be this obvious advantage to the employer: It costs the firm a large and undeterminable sum to educate an employee, both in pay and in mistakes made. During the senior year the employer will

not be paying the pupil while he is being educated, except for the actual time the pupil may be engaged in the work in the business house. The employer can afford to pay the pupil during the vacation following the junior year to fill the place of messenger or junior clerk of the simplest form, because by doing so the pupil for the following nine months, with the aid of the educational courses of the school, will be far more thoroughly trained at the school's expense than the employer can do it. Upon graduation the pupil will enter the business with a foundation laid that will enable him "to earn his salt" from the beginning. The foundation laid by the summer's practical experience and the school's intensive courses in foreign trade will enable the pupil to grasp the details peculiar to the business in which he is employed more quickly than would have been the case if either method of learning the business had been followed separately, i. e., experience alone or school alone. It has been shown in other fields of commercial education that he will advance in this business more rapidly than if he ~~had not~~ had this school training.

The obvious advantages to the school of the practical experience of working in an expert department will be that the pupil will work quite differently if he has the feeling that he is preparing to do something very definite and tangible and knows that he is to enter a position if he makes good in his studies. The total result of a cooperative plan of studies is the true object of vocational education to train persons to do a worthy day's work better and more efficiently.

In the case of college students the National City Bank of New York has organized training for foreign trade on very much this basis. In the case of the bank the plan as worked out is far more complete than the commercial or foreign trade curricula of the various colleges and universities where the students are getting their college education. The example set by the bank should lead the educational institutions to improve the study plan for foreign trade to make it harmonize and synchronize with such part-time teaching. At present the bank is teaching many subjects which should be taught in colleges. The bank's time should be free to teach its own particular business. This, of course, is the great problem of the entire educational work in foreign trade.

It must repeatedly be emphasized that as education for foreign trade develops it can only develop in so far as it fills an actual need of the merchandising houses. The employer will be increasingly willing to cooperate with the educational system as this system becomes more efficient in training men to order. Unless there is as close a connection between foreign-trade education and business

houses engaged in foreign trade as it is possible to establish, there will be not only a lack of practicability in the training given the students, but also there will be a lack of contact with the job.

SUGGESTIONS FOR A CONTRACT AND FOR RULES AND CONDITIONS GOVERNING PART-TIME WORK IN COOPERATIVE FOREIGN-TRADE EDUCATION.

It is quite essential in the practical working of the cooperative plan for foreign-trade education that all parties to the agreement should have their position squarely understood and incorporated in a set of rules or contracts which should be adopted for this purpose. The moral effect upon everyone concerned and the sense of responsibility will be decidedly enhanced by such agreements. It is exceptionally necessary that the boys or girls realize that the agreement is a binding contract and they are expected to fulfill their part. It will also have a settling influence on the young person to understand that he has entered a definite business relation with a responsible business firm. It is also essential to hold over the student the fact that he can not get his diploma from the high school unless he has satisfactorily completed his work with the firm. It is also necessary to have him understand that he owes an obligation to the firm which has taken him in and that he should serve this firm faithfully and not leave at the first opportunity to go to some other firm which may offer him at the moment a slight increase in pay. It is also necessary to have the parents or the guardian of the pupil agree to the arrangement concerning the pupil between the business house and the school. The following are merely suggestions which are only intended to help point the way.

A SUGGESTED CONTRACT.

This agreement is made this _____ day of _____, between _____, doing business in _____, hereinafter known as "Company," and _____, of _____, hereinafter known as "Apprentice," and _____, of _____, hereinafter known as "Guardian," whose relation to the Apprentice is that of _____.

For the purpose of acquiring practice, skill, and knowledge in the business of the foreign trade of the United States, said _____ hereby becomes an apprentice to the Company, and the Company hereby accepts him subject to the terms herein stated.

The Apprentice and his Guardian hereby promise that during the period commencing the first Monday after the close of the _____ High School in the year _____ and terminating on the last Saturday prior to the opening of the said school in said year, and such further period during the school year _____ as may be agreed upon between the Company and the principal, or some person designated by said principal, the Apprentice will faithfully serve said Company in such capacity or capacities connected with the exporting and importing business connected by said Company as shall be agreed upon between the Company and the principal of the said school.

The Apprentice furthermore agrees during the period above stated to do all in his power to learn the exporting and importing business and to promote the interests of the Company. He also agrees to continue his studies in foreign trade in the said high school and to do a reasonable amount of home study in connection therewith and with his service with said Company.

It is agreed by the Apprentice and his Guardian that the Company shall have the right at any time to discharge the Apprentice for inadaptability for the performance of the service assigned, for disobedience of the rules and regulations of the Company, and improper conduct in or out of working hours.

The Company agrees adequately to train and instruct the Apprentice in the principle operations of its business, in so far as the same relate to the foreign trade; to pay to the Apprentice during the period herein stated the compensation hereinafter specified, and if the Apprentice shall remain in its service for the full period set forth herein and render satisfactory services in the positions held by him to present to him at the termination of such period such evidence of satisfactory completion of his apprenticeship as may be proper and requested by the principal of the said school.

The Apprentice shall receive from the Company the following compensations, to wit:

For the period from the first Monday after the close of high school until the last Saturday prior to the opening of said school, during which period the said Apprentice shall devote his entire time and energies during business hours to the service of the Company as hereinafter provided ————— dollars per week. For such further period during the school year as may be agreed upon between the Company and the principal ————— per week.

The Apprentice and his Guardian also agree that in the event the said Apprentice shall satisfactorily complete his high school course in foreign trade and his apprenticeship as herein provided, that he will for a period of one year from the termination of said high-school course serve the Company in the capacity of junior clerk at the prevailing rate of wages for this class of service, and the said Company hereby agrees to employ the said Apprentice in such capacity for such period and at such rate of pay.

_____,
Company.

_____,
Apprentice.

_____,
Guardian.

PRACTICAL SUGGESTIONS.

Each boy when he enters upon his duties in a merchant house should receive a list of the following or similar suggestions.¹

INFORMATION FOR COOPERATIVE APPRENTICE.

Read this carefully. It will save you and us trouble.

Remember that the object of your work is to help the firm to make a profit. Your employer measures you by the quantity and quality of the work you perform.

Social position does not enter here. In the office you are not a high-school boy, but you are an apprentice. Dress and act accordingly. If you get the

¹ It is a general complaint that high-school boys, and to a lesser degree college graduates, have a know-it-all air which is not only offensive, but hurts efficiency. These suggestions are freely adopted from those used by the Litchfield, Mass., cooperative plan. Some effort is necessary to confer these ideas to the apprentice in verbal or written form.

idea that any work given you is beneath the dignity of a high-school student, just remember that all alike must begin at the bottom of the ladder and that you are an apprentice in this firm while you are here. Don't put on superior airs. Remember that the boy who has not had your advantage, by experience and hard work has probably learned the work of his own desk much better than you will be able to know it for a long time. No one has a monopoly of knowledge. He probably knows as many things that you don't know as reversed.

Remember that in a true democracy and with true Americanism one man is entitled to as much respect as another if he does his work faithfully, honestly, and to the best of his ability.

It is your business to get along smoothly with the men higher up, and not theirs to get along with you.

Do not expect any exceptional personal favors or attention from your superiors other than instruction in the performance of your task. They will probably ignore you as long as you are doing your work well, as they are too busy to pay much personal attention to anyone, but they know whether you are making good or not. The opinion which your employer or your superior has of you depends on whether you are making good or not.

Don't bother your employer for a raise in wages, as that has been settled for the period covered by the agreement.

If you have a grievance with your firm, take it up with your school adviser.

Errors are exceptionally serious in foreign trade and mean loss to the firm.

Your errors greatly decrease your value to the firm. Try never to make a mistake; if you make a mistake once, never do it again.

Never try to conceal or cover up an error. You can save yourself and the firm much trouble and much loss by bringing an error immediately to your next superior's attention.

Watch what is going on about you and keep your mouth shut. However, don't be afraid to ask sensible questions. Try to answer the question yourself first.

Almost the greatest compliment that can be paid an employee is, that he has common sense. See that you exercise common sense in what you say, in the questions you ask, and in what you do.

Don't be afraid of listening to something you have heard before. Ten things you may have heard before, but the eleventh may be an important addition to your store of knowledge and to your future.

If you do not like a decision of your immediate superior don't go over his head to a man higher up. It will cause friction and bad feeling. If you have a real grievance, take it up with your school advisor.

You are not responsible alone to yourself for your action as a cooperative apprentice. If you do not make good it will spoil the chance of many others to get a start in life in the exporting field because you have discredited your school and the cooperative system. Remember that you are given a golden opportunity to make the future for yourself and to serve your country in a field of activity which is vital to the future of our great United States.

A COLLEGE PART-TIME SCHEDULE.

An adaptation of the part-time system to the courses outlined in this bulletin and applied to college seniors is suggested by the following study plan. The lessons as planned in the evening courses for

once each week will be divided over two, three, or four hours during the week.

The student will study mornings and work afternoons and Saturdays at the offices of his cooperating firm. Broken time is not as satisfactory as it should be desired, yet by letting the student go to the business afternoons instead of mornings he will be on duty when the press of work is greatest during the latter part of the day, and will also be able to stay over, past closing time, to finish his work if need be. This schedule—class mornings, office afternoons, and study nights—is not light. However, if he were taking a course in chemistry, the day would be just as full with afternoons in the laboratory. The schedule is not heavier than any “science course” at Columbia or other similar universities.

It will be noted that the first term is concerned largely with shipping subjects. The second term has to do with selling. This will enable “special students” to take the single course with which their work has to do.

The absence of languages in the study plan is based on the fact that, after learning the routine of foreign-trade practice and the student specializes in a commercial area (graduate year of extension courses), a large part of the time will be devoted to the intensive and thorough study of the one of the 10 or 12 commercial languages in which the student must learn to speak fluently and correspond correctly, if he is to be efficient in doing business in a particular part of the world. About as much time or more devoted to the study of Russia, its history, people, markets, geography, commercial law (law and order must return some time), business methods, etc., should be devoted to practical language drill, sales talk, letter writing, and social conversation.

A TWO-TERM COLLEGE PART-TIME SCHEDULE.

FIRST TERM.

	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
9 10	Shipping..... Marine insurance.. (International law)	Ports..... Staple products, two hours.	Shipping..... Marine insurance.. (International law)	Ports..... Staple products, two hours.	Shipping. Marine insurance. (International law).

SECOND TERM.

	Tariffs..... Export combina- tions. (Selling).....	Foreign exchange. Documents, two hours.	Tariffs..... Export combina- tions. (Selling)	Foreign exchange. Documents, two hours.	Tariffs. Export combina- tions. (Selling)
9 10					

(30 points.)

**CERTIFICATES OF COMPLETION OF FOREIGN-TRADE SCHOOL—IN PARTICULAR
THE CHAMBER OF COMMERCE SCHOOL OR OTHER EVENING SCHOOLS.**

It will be necessary to have some established form of certificates of proficiency which the students will receive who have satisfactorily completed the courses of study outlined by the bulletin and conducted under the auspices of the Board. It is therefore suggested that a uniform certificate be adopted which will show clearly the following information:

The following course has been taken by _____, and satisfactorily completed as follows:
[Student.]

Here should follow a list of exactly what the courses have been, with the student's grade. In another column following, the number of hours per week, then the number of weeks, and finally any remarks. Under "remarks" should be added the name of the teacher under whom the student took this particular course. There should be a statement of the amount of practical work, the nature of the same and the quality of its performance signed by the firm concerned.

The original certificate should be on parchment paper and of the approved diploma style. In addition there should be a number of duplicates in the same form, but not the same kind of paper or color, which can be filled in on the typewriter with carbons and which will be certified, true copies of the diploma. The student, upon completion of the course, may be in search of a position with a foreign-trade firm. If he has such a certified copy of his diploma which gives the full information regarding the courses which he has taken and just what the courses were, he can use the name in applying for a position and can send the certified copy along with his application.

There is another use to which this certified copy should be put. It is to the interest of the Bureau of Foreign and Domestic Commerce to have the record of all the men who have taken properly conducted foreign-trade courses. The bureau is constantly in search of men not only for itself, but in answer to inquiries from merchants throughout the country. If the certificates can be forwarded to the Bureau of Foreign and Domestic Commerce, and there filed, the bureau will have at an instant's notice the information regarding each student.

It will be also to the interest of the Federal Board for Vocational Education to have such certificates on file in its office for general reference and for statistical laboratory investigations of the eventual careers of students thus trained. An annual system of follow-up questionnaires will give valuable data as to the practical value to the student's advancement from his foreign-trade studies.

In collecting information regarding personnel it may be of advantage to add another sheet which the student will fill out and file together with the diploma. This sheet should give a brief biography of the student and in addition should state whether he is engaged in business at the present time, whether this is an export business; if so, his particular duties in the business; and if not in export business, if the student is anxious to get into the export business and if he desires to go abroad to live. The student should affix his photograph and any other credentials which we may desire and the entire document would be filed in some convenient office in Washington. If it is not the desire of the bureau or either of the boards to make of itself an employment office, it may be of great value in promoting foreign trade and shipping to have some center of information for personnel.

NOTE.—Minimum hours required for a certificate is tentatively placed at 14. This would mean 3½ hours two evenings each week for two terms of 15 weeks each.

SUGGESTED DIPLOMA.

THE CHAMBER OF COMMERCE SCHOOL FOR FOREIGN TRADE AND SHIPPING.

To all whom these presents come, greeting:

Be it known that JOHN SMITH has satisfactorily completed the general courses in *foreign trade*, as set forth below.

Subject.	Grade.	Hours per week.		Weeks.	Instructor.	Remarks. [Note if course was as prescribed by bulletin or independent.]
		Class.	Labor.			
1.....
2.....
3.....
4.....
5.....
6.....
7.....

Conducted under the auspices and supervision of the Federal Board for Vocational Education, the Bureau of Foreign and Domestic Commerce, the United States Shipping Board, and the Chamber of Commerce of ———.

Signed I. _____

[Director.]

Signed II. _____

Date _____

The practical experience of months _____ days _____ was had in the _____

Signed _____

[Officer of the company.]

STUDY OUTLINES OF FUNDAMENTAL COURSES.

REQUIRED SUBJECTS AS FOUNDATION FOR ADVANCED STUDIES IN FOREIGN TRADE AND SHIPPING.

1. Reading in sales practice.
2. Document technique of foreign trade.
3. Staple commodities of commerce (commercial geography).
4. Foreign exchange.
5. Principles of ocean transportation.
6. Ports and terminal facilities.
7. Tariffs and treaties.
8. Export combinations and the Webb law.
9. History of commerce.

NOTE.—Other courses now in preparation will be announced when completed and may be had on application.

TEACHING SUGGESTIONS.

It has been found efficacious in keeping all the class at work to give a 15-minute written quiz on the assigned reading. At the opening of each period quiz books should be on each desk when the student arrives. Question should be written on the board promptly at the beginning of the period. The question should call for short, precise answers which will not take long to write nor long to read, yet will test the intelligence with which the student has read the assignments.

Assignments of reading as noted in the various outlines are often several times the capacity of a student to cover for one lesson. This is particularly true of those who are employed during the day. The outlines and readings have been made full (1) for the benefit of the teacher, (2) for full-time college courses where the ground will be covered in several hours each week, (3) because the textbooks contain the material. The difficulty of covering so much ground in one assignment should be met by part assignments. The lesson should be divided into convenient lengths and each length assigned to a part of the class for report. Each section given a part assignment should prepare to give the class orally a summary from an outline and not more than 5 to 10 minutes long. Such a summary of the reading should contain as much as possible of the student's application of the principles involved to the business with which he is familiar. With a little planning and coaching on the part of the instructor the reports should give all the class the main features of all the reading as well as practice in making and presenting such short reports.

It will be noticed that the study outlines are, as a rule, the chapter headings and table of contents of the assigned text. This is for a purpose: (1) A course should follow the adopted text as a basis

without material change of order. It saves confusion in the assignments which is usually sufficient excuse not to read the lesson at all.

(2) From an outline cross references from other works is easier.

(3) The outline as such in the bulletin serves to keep the contents and nature of each course at hand without constant reference to the textbook. Acknowledgment to the author of the text from which the outline is taken in each case is hereby made.

The teacher should read all of the assigned reading and texts well ahead of the class.

STUDY OUTLINE OF FOREIGN TRADE 1.

SELLING METHODS.

The two fundamental courses of the curriculum of foreign trade as outlined by this bulletin are:

Foreign trade 1.—Readings in exporting methods of foreign trade.

Foreign trade 2.—The document technique of foreign trade.

The entire foreign-trade curriculum is built up on these two courses. Likewise the bases of shipping studies is the course on ocean transportation.

The first important course of the curriculum is the study of marketing methods. In order to present the widely scattered material in the confines of one volume a collection of readings with annotations and comments has been prepared and herewith presented as the text for the course. Any study of foreign trade must commence not only with the actual technique of executing the same, but with a clear understanding of the various sales' channels which are used in overseas commerce. It will be the object of this course, as far as possible and in as practical a method as possible, to make clear to the students the various selling organizations which are successfully being used by various classes of American exporters. The course itself will follow the book of readings which has been specially prepared for this purpose. This outline, entitled "Sales practice," will give an idea of the contents of the volume of the subjects which will be covered in the course.

Text.—"Sales practice," published by the Bureau of Foreign and Domestic Commerce and the Federal Board for Vocational Education. Compiled with explanatory text by Dr. Guy Edward Snider. It will be on sale at the Government Printing Office, Washington, D. C.

The course should be conducted by means of lectures, discussion, and reports.

The period of an hour and a half should be divided between explanatory discourse (one-third) by the instructor, followed by a general class discussion and reports.

The readings are chiefly the testimony of business men on the methods they have found effective and the reports of experts on the methods employed in various markets. Obviously the methods will vary, not only as between lines but also in the various markets. The class should have a notebook in which the readings should be analyzed and classified—first according to the class of goods to be marketed; second, the functions of the various trade channels; and third, the factors in the foreign markets which affect the method of contact.

The work will consist of reading as much as possible outside the classroom and discussions of the problems of the same in the classroom. The teacher will lead the discussion and promote independent contribution of information on the part of the students. The students, from early experience in the business or from their part-time work, should be able to contribute much information of a specific character on the subject with which they are familiar.

Each student during the term should be required to prepare one paper on some specific line of goods to one or more specific foreign markets in addition to reading reports for class.

As collateral reading it is recommended to select from a list of Government publications those bearing on this subject. These publications should be owned by the instructor for his own work in preparation for conducting the course. In addition several copies of the same should be on the reading shelves of the school where the course is being given.

Lesson I.—Survey of export sales problems (Ch. I):

- Problems of the smaller manufacturer.
- Making of an export policy.
- Examples of American export enterprise.
- Problems of the smaller manufacturer answered.

Lesson II.—The study of the market (Ch. II):

- Business men on the study of the market.
- Questionnaire method.
- General survey.
- Fundamental conditions.

Lesson III.—Direct sales problems (Ch. III):

- Testimony of Mr. James A. Farrell, president of the United States Steel Products Export Co.
- Testimony of Mr. R. H. Haney, foreign sales manager of the International Harvester Co.
- Market control in Argentina.

Lesson IV.—The export middleman (Ch. IV):

Part 1. Functions—

- Business men on the history and functions of the export middleman.
- Outline of the functions of an export merchant

Part 2. Markets and lines—

- Construction materials and machinery in Colombia.
- Markets for machinery and machine tools in Bolivia.
- Cotton goods in China.

Lesson V.—Agencies and agents (Ch. V):

Part 1. Functions and policy—

- Business men's testimony.
- Reports of consuls.

Part 2. Markets and lines—

- Hardware in Chile.
- Agricultural implements and machinery in Brazil.
- Cotton goods in Ceylon.
- South American markets for fresh fruit.

Lesson VI.—Traveling salesmen (Ch. VI) :**Part 1. Functions—**

Business men's testimony.

Part 2. Markets and lines—

Agricultural implements and machinery in South Africa.

Boots and shoes in Cuba.

Hardware in Russia.

Lesson VII.—Contact by mail and advertising (Ch. VII) :**Part 1. Correspondence.****Part 2. Catalogues.****Part 3. Advertising.****Part 4. Exhibits, fairs, etc.****Part 5. Parcels post.****Lesson VIII.—Export-trade combinations (Ch. VIII) :****Part 1. Advantages of cooperation in selling.****Part 2. Cooperative buying in foreign countries.****Lesson IX.—Hardware sales problems in selected markets (Ch. IX) :**

Far East.

France.

Brazil.

Australasia.

Lesson X.—Sales factors in marketing electrical goods (Ch. X) :

Sentiment and tariff in New Zealand.

Standards and prosperity in Cuba.

Investments in Peru.

Lesson XI.—Miscellaneous sales factors (Ch. XI) :

Trade organization for harvester market in cotton textiles.

Educating foreigners in the United States.

Influence of roads and land holdings.

Influence of established connections.

Influence of economic and commercial progress.

Influence of technical and professional training.

Lesson XII.—Terms of payment (Ch. XII) :

Credit and credit information.

Business man's part in foreign exchange.

Financial documents.

Lesson XIII.—Terms of delivery (Ch. XIII) :

Advantages of c. i. f. quotation.

Quotations illustrated.

Efficiency in handling export orders.

Packing for export.

Transportation routes.

Lesson XIV.—Tendencies in economic reconstruction (Ch. XIV) :

Part 1. Extension of Government participation in trade and industry.

Part 2. Control over essential products.

Part 3. Economic alliances.

Part 4. Preparation for after-war period.

Lesson XV.—Export-trade aids (Ch. XV) :

Part 1. Government agencies.

Part 2. Export-trade associations.

Part 3. Chambers of commerce.

Part 4. Miscellaneous activities.

STUDY OUTLINE OF FOREIGN TRADE 2.

THE DOCUMENT TECHNIQUE OF FOREIGN TRADE.

Although every exporting house has its own documents and forms, there are certain documents which are generally used throughout the entire business of exporting and importing. An understanding of these documents, their uses and the meaning of all the fine print and phrases which are on them will be the necessary basis for an understanding of the particular documents used in any particular business house or foreign field. The necessity for an understanding of the detail of the document technique is generally conceded. It is also one of the most difficult to teach. It has been found in the past that a descriptive course of lectures did not get very far. In the learning of the intricate detail of foreign trade document technique, it is necessary to apply the well-known principles of "learning by doing." It will be the aim of this course to accomplish this. The course therefore has been planned as a lecture and text course for part of the lesson period and actual practice in handling and filling out documents in the second part of the period. It is difficult to describe a document and to follow all the phrases and clauses on it unless each student has a copy of it in hand. Therefore, in order to make it possible for each student to have a copy as nearly like the copy he would actually use in business, the textbook consists of two parts, a descriptive text and a collection of "vouchers," as they call them in teaching book-keeping. The mere filling out of the document with no further attention to the meaning or the uses of the document would be of little value. It is exactly this which makes the average clerk little more than an automaton, who automatically fills out certain blank spaces in certain yellow or blue slips. It is necessary to carefully go over each document in the classroom and not only explain the use to which it is put and how to fill it out, but to explain as far as possible, within the limits of this course, its commercial and legal aspects and the importance of some of the fine print on the same. After this has been done it is then possible to show the student how to make out the document. By actually filling out the form under discussion the pupil will learn more about it and fix in his mind the discussion concerning it.

As will be seen by the outline, the course will consist of a series of lectures, each one handling a particular phase of the export ship-

ment. The individual chapters will be written by specialists in the particular field of which the chapter deals.

In order to give continuity to the course, four or five typical shipments will be followed through from the beginning to the end of the course; that is, if George Borgfeldt is shipping so many cases of dolls, this shipment of dolls will run through the entire course. Likewise, if the International Harvester Co. is shipping tractors or gas engines, this particular shipment will run through the entire course.

However, although the typical shipments extend through the course, it will be necessary to illustrate many features by other documents. These documents may cover the point in question in the chapter, and have no connection with the typical shipments mentioned above. In other words, there will be two classes of documents—those which belong to the four or five typical shipments and as many other loose or odd documents as the collaborator on the particular chapter may deem necessary to make clear his discussion.

The last lessons of the course will be devoted entirely to making hypothetical shipments from beginning to end, utilizing the knowledge acquired earlier in the course. These problem shipments, which are to be made on the blank vouchers furnished in the collection of documents and which the student himself is to fill out, may also continue throughout the course, and, in addition, there may be problems involving the use of any one document in any particular case. It will tax the ingenuity of the teacher to bring together the factors in this work in order to give continuity to the problems and to the shipments. When the basic principles as set forth above are clearly in mind, this should not be difficult.

TENTATIVE STUDY OUTLINE.

1. General history of an export order, explaining documents which are involved.
2. Tender and quotation, explaining terms of sales:
 - (a) Description of goods.
 - (b) Terms of delivery.
 - (c) Terms of payment.

{

Class make out a problem tender.

Show examples—several typical trades examples.

Documents—boots and shoes, cotton goods, machinery (gas engine), some machinery erected.
3. The order (marks):

Signed quotation—shipping directions.

packing directions.

tariff classification.

confirms tender.

(Good and bad examples.)
4. (a) Export license (not discussed in detail) needed to get permit.
- (b) Railroad bill of lading to the forwarder.

5. (Goods in hands of the forwarder) ;
 - (a) Freight contract form between forwarder and freight broker.
 - (b) Shipping permit.
 - (c) Dock receipt.
6. Shippers' export declaration.
Ocean bill of lading.
7. Ocean bill of lading (cont.).
8. Insurance.
9. Consular invoice.
Certificate of origin (sanitary inspection).
10. Invoice (opportunity for review).
11. Financial documents.
12. War Trade Board export permits, etc.
- 13, 14, 15. Three practice nights for complete sets.

STUDY OUTLINE OF FOREIGN TRADE 3.

STAPLE COMMODITIES OF WORLD TRADE.

COMMERCIAL GEOGRAPHY.

Text: Finch and Baker, "Geography of the World's Agriculture," published by the United States Department of Agriculture. Government Printing Office, Washington, D. C., 1917, \$1.

A geographical notebook: Also 20 outline maps of the world.

Student's equipment (In addition to texts); 1 centimeter rule; 1 small compass for lead pencil; collection of lead and colored pencils; 1 World's Almanac; 1 Statistical Abstract of the United States.

Classroom equipment: 1 set commercial wall maps; 1 large blackboard triangle; 1 blackboard compass (circle); outline maps for blackboard or wall.

Reference texts: Statistical Abstract of the United States, Bureau of Foreign and Domestic Commerce; Year Book of the Department of Agriculture; Keltie's Year Book; World's Almanac; annual reports of Government departments, boards, and bureaus.

GOVERNMENT PUBLICATIONS.

For teacher's reference and assignments for individual papers (such assignments not practical in the case of evening courses, as student has no time outside). There may be mentioned the following books and pamphlets published by the Bureau of Foreign and Domestic Commerce of the Department of Commerce, and are to be had from the Superintendent of Documents, Washington, D. C.:

Cottonseed Products and Their Competition on Northern Europe. Special Agents' Series No. 84.

Cottonseed Industries in Foreign Countries. Special Agents' Series No. 99. 10c.

Foreign Markets for Cotton Linters, Batting, and Waste. Special Agents' Series No. 80. 10c.

Terms Used in the Cotton Industry. Special Agents' Series No. 105. 10c.

Cocoa Production and Trade. Special Consular Report No. 50.

Foreign Trade in Denatured Alcohol. Special Consular Report No. 51.

The Gothenburg System Law Governing Manufactured Alcoholic Beverages. Special Consular Report No. 49.

Markets for American Fruit. Special Consular Report No. 62.

Foreign Salt Market and Industry. Special Consular Report No. 52.

By-products of the Lumber Industry. Special Agents' Series No. 110. 10c.

Pineapple Canning Industry of the World. Special Agents' Series No. 91.

Utilization of Potatoes in Europe. Special Consular Report No. 64.

Foreign Markets for Coal. Special Consular Report No. 69.

Tobacco Trade of the World. Special Consular Report No. 68.

Optical Goods Trade in Foreign Countries. Special Consular Report No. 46.

Foreign Markets for Railway Supplies. Special Consular Report No. 60.

Paper and Stationery Trade of the World. Special Consular Report No. 73.
The Pottery Industry. Miscellaneous Series No. 21. 50 cents.

Time: For extension and evening courses two hours, if one evening a week; 8 to 9, lecture and discussion; 10 minutes recess; 9 to 10, work on graphic statistics and maps.

For day classes at least two lectures and four laboratory periods each week for one term; 15 weeks.

METHODS AND SUGGESTIONS FOR THE STUDY OF COMMERCIAL GEOGRAPHY AS ONE OF THE COURSES OF STUDY FOR FOREIGN TRADE.

The study of place geography is most essential. As a rule the ignorance of the location of important commercial countries and places is appalling. It is absolutely necessary that any courses purporting to train men for foreign trade should be very particular that place geography should be well taught.

The easiest way to teach place geography is to teach the location of a town or a country or a port in connection with the part that place plays in international commerce.

We must face the fact that many persons entering foreign-trade houses have little knowledge of the nature and origin of the most important articles of commerce.

Therefore the necessity for teaching place geography and the necessity for teaching the origin and nature of the staple articles of commerce both together may be taught in a laboratory course as herein outlined. Here the word "laboratory" is used to indicate outline map work and graphic presentation of statistics by the student. In nearly all of the textbooks on commercial geography the material is meager at the best, as must needs be in trying to compress a field as large as the whole world into a small hand textbook. In addition, the material has been gathered and presented according to political, geographical divisions of the earth's surface. Experience has been that in teaching materials of commerce the only method to keep the relative importance of the various staples in mind, regarding the sources and the consumption of the same, is to study each product of the many most important by itself. By the time the leading products have been covered there should have been acquired a very good knowledge of political subdivisions and location of places.

To teach the origin and disposition of the chief commodities of commerce and have the relative importance of various places remain distinct in the mind, it is best to teach by the use of graphic statistics and maps. Therefore the laboratory method, by which is meant map drawing and graphic statistics, is very well adaptable to the teaching of commercial geography, thus applying the well-tried methods of the "learning-by-doing" principle. If for each world product the student must locate on the map all the important places involved,

they will be forever associated in the memory with the staple and will be more readily retained in the memory. If the teacher simply lectures and tells about the product in a descriptive way it can not be as clearly understood as if the pupil himself worked with the maps and statistics. The relative importance of the various producing, exporting, and importing countries will likewise be clear and will be retained if the student in addition to constructing a products map must also construct simple statistical graphs.

To make the laboratory method as direct as possible it will be necessary to follow a notebook. In this notebook are to be found outline maps and paper.

The method to be followed: The statistics will be placed in a column. Then the figure will be translated into units of length and bars drawn with the most important items at the top on the ruled paper. If the representation, after assembling and graphing the statistics, is one of percentage of a total product the circle may be well used. The map is drawn out in full. It is better to locate the places on the line map during the discussion, as this serves to fix the location with the fact concerning it.

No place should ever be mentioned without making sure that all present know where the place is located. The place may be pointed out on the wall map or may be also noted on the student's outline at the same time.

The laboratory method and the method of presenting the material according to commodities rather than political divisions should give not only a good knowledge of these leading commercial staples, but should impress the location of the places and countries of commerce upon the mind of the student so clearly that the fact will not be easily forgotten.

The laboratory method, in addition, will teach the student where to go to look up statistical facts and how to use these facts and present them in such a form that all can understand their relative importance and significance.

No course puts as much work on the instructor as this. To make the discussion (lecture) animated, interesting, and instructive beyond the confines of the textbook it will be necessary for the instructor to follow a wide field of outside reading and make himself secure in the facts concerning many activities.

The laboratory notebook here recommended was designed for a general high-school course, therefore the attention given to the United States. In college or evening courses it is assumed that the student has studied the commercial geography of the United States, and therefore the United States will receive no more attention than other parts of the world.

OUTLINE OF THE COURSE.

(It will be of great advantage to ascertain as closely as possible a week or two in advance how many students will be in the course and make arrangements accordingly with the publishers to forward this number of texts, with the understanding that if the full amount of texts are not taken by the students that the same may be returned. This will enable the course to start full speed. Otherwise there will be a loss of practically one entire lesson. In the case of the evening courses, where the students only meet once each week for 15 weeks, this is a serious loss and hard to make up.)

LESSON I.

Assignment.—None.

The instructor will cover the essential features of the first two chapters of the text in a talk. This talk may be based almost entirely upon these two chapters, with such additions as the instructor sees fit.

Next assignment.—The cereals. (Assign one or two topics only to each group of students.)

LESSON II.

Text.	Map work and statistics (in a notebook).
The cereals:	
Wheat.....	On map wheat areas of the world. Graph, production by countries. Graph, yield per acre by countries. Export and import by countries.
Rye.	
Oats.	
Barley.	
Buckwheat.	
Rice.	
Millet and sorghum.	
Corn.	

LESSON III.

Starch foods.....	Chapter IV and V, pages 102-201.
Potatoes.....	Map, world potatoes areas. Graph, potato producing countries. Graph, field per acre per capita.
Sweet potato.	
Cassava.	
Banana.....	Map, banana areas of the world. Graph, exporting and importing countries of the banana trade.
Manufactured starch	
Sago.	

The animal industries:

- Swine-----Map, swine areas of the world.
 Graphs, showing the relation of swine to population
 to area of countries.
- Cattle.
 Hay.
 Dairy farming.
 Dairy substitutes.
 Sheep and wool-----Wool graphs and maps.
 Draft animals.
 Poultry and small ani-
 mals-----Map of egg areas of the world.

LESSON IV.

**Vegetable, fruit, and wine
 industries:**

- Apples.
 Peaches.
 Canning industry-----Maps of world conserves supply.
 Dried fruit industry,
 figs, dates.
 The grape-----Wine area of the world with exports and imports—
 maps and statistical graphs.
 Sugar beet-----Map with two colors of cane and beet sugar pro-
 duction.
 Sugar cane-----Graph per capita consumption. Relative production
 by countries.
 Relative export and import by countries.

LESSON V.

**Coffee, tea, cacao, spices,
 tobacco:**

- Coffee-----In each case world map and comparison of production
 by areas, also exports and imports.
- Tea.
 Cacao.
 Spices.
 Tobacco.

LESSON VI.

- Iron and steel-----Map of iron-ore production, brown.
 Map of pig-iron production, blue.
 Map of steel production, red.
 Graphs of same.

LESSON VII.

- Coal and water power---Map of world's coal areas.
 Coal-----Coal production by countries. Line graph.
 Coke gas and by-
 products.
 Water power-----Map of world's water power.
 Petroleum-----Map of world's oil fields. Line graph of production by
 countries.

LESSON VIII.

Fisheries, lumber, and paper-----

Fisheries-----Map.

American coast and

open sea-----On map, yellow.

Sealing-----On map, red.

Oysters, etc., clams,

sponges and pearls-----On map, brown.

Lumber-----Map.

Paper industry, wood

pulp, etc-----Line graph of national production.

LESSON IX.

Cotton, cotton by-products, and cotton textiles.¹

Cotton areas and

production-----Map of areas. Line graph of national production.

Cotton by-products-----Make list of the same.

Cotton spinning and

weaving-----Line graphs by countries.

Textiles — produc-

tion and markets---Circles on map (circles are to each other as the squares of their homologous lines. Therefore, extract square root of the statistics, take unit of desired length and value for the diameters of the circles).

LESSON X.

Wool, silk, and other textiles-----

Map with circle graphs.

Wool-----Map and colored areas, graphs.

Woolen goods-----Map and colored areas, graphs.

Silk-----Map and colored areas, graphs.

Silk goods-----Map and colored areas, graphs.

Flax.

Linen.

Hemp-----Map—colored areas.

Jute-----Same map—another color, crosspatched.

Clothing trade.

Paris goods, etc.

LESSON XI.

Leather, leather goods, hides and pelts—Boots and shoes—Rubber and rubber goods:

Hides and skins—

sources and trade. Map with colored area.

Tanning industry. . . Same map with another color.

Shoe manufacturing. Same map with another color.

Glove manufacturing. Same map with another color.

Rubber, supply-----Map with colored area.

Plantation rubber----Same map with another color.

Rubber goods.

(These topics must be enlarged upon by addition of matter contained in the publications of the Bureau of Foreign and Domestic Commerce.)

¹ It will be necessary to make liberal uses of the reports of the Bureau of Foreign and Domestic Commerce, enumerated.

LESSON XII.

Machinery and shipbuilding.

Leading machine exporting

countries-----Line graph, indicating relative value.

Agricultural machinery---Line graph, indicating relative value.

Carriages wagons, and

automobiles-----Line graph, indicating relative value.

Machinery for manufacturing and machine

tools-----Line graph, indicating relative value.

Railroad equipment-----Line graph, indicating relative value.

Shipbuilding (must be

brought to up to date)---Line graph, indicating relative value.

Manufacture of novelties---Line graph, indicating relative value.

LESSON XIII.

Chemicals, raw and manufactured materials:

Fossil phosphates.

Potash.

Nitrates.

Soap-making materials.

(To be made up in extent and detail by the collateral reading and by the instructor.)

LESSON XIV.

Building materials-----Make cross-hatching in different colors to represent each of the following—on map.

Brick.

Building stone.

Limestone.

Marble.

Cement.

Pottery, porcelain, and

glass-----Colored lines on outline map.

Copper-----Color on outline map using a different color.

Tin-----Color on outline map using a different color.

Aluminum-----Color on outline map using a different color.

Gold and silver-----Color on outline map using a different color.

Diamonds-----Color on outline map using a different color.

Lead-----Color on outline map using a different color.

Zinc-----Color on outline map using a different color.

LESSON XV.

Examination or review of other material and staples.

STUDY OUTLINE OF FOREIGN TRADE 4.

FOREIGN EXCHANGE AND FINANCE.

For reference: Wolfe, Archibald J.—“Foreign Credits.” Special Agents’ Series No. 62. Department of Commerce and Labor. Government Printing Office, Washington, D. C. 1913.

OUTLINE OF COURSE.

LESSON I.

Introductory.

Foreign exchange; what it is—How payments between countries are made—Function of the foreign-exchange bankers—The rate of exchange between two points determined by conditions at both points—The “seesaw” principle in exchange.

Par of exchange.

What the par of exchange between any two countries is and how it can be found—Weight and fineness of coins—Influence of the mint par on the rate of exchange.

LESSON II.

International banking.

Sterling the one international currency—Balances carried by foreign banks in London—The London discount market—The new discount market at New York—Financial confidence a plant of slow growth—The volume of business in sterling as compared with other currencies.

Sources of supply and demand.

Supply I: Merchandise export—Supply II: Exports of securities—Supply III: Foreign loans to this market—Supply IV: International services rendered by us. Demand I: Merchandise imports—Demand II: Imports of securities—Demand III: Repayment of foreign loans—Demand IV: Interest and dividend remittances—Demand V: International services rendered to us—Demand VI: Remittances by resident foreigners.

(See also Peddle, pp. 14, 61-84.)

LESSON III.

The rise and fall of the exchanges.

Merchandise exports and imports the primary factor—Bills sold for future delivery—Security purchases and sales and their powerful influence on the exchange market—Influence of the making of short loans to this market and of their repayment—The stabilizing influence of “futures”—Interest and dividend remittances.

Principal rates of exchange.

The rate of exchange at New York on London, Paris, and Berlin illustrated and explained.

LESSON IV.

The different kinds of bills of exchange, bankers' and commercial.

Definition of terms used in the exchange markets—Bankers' "cables" and short bills—Bankers' long bills—Commercial bills, clean—Commercial bills, documentary—Documents for "acceptance"—Documents for "payment"—The two classes of bills compared.

Price relationship of the different kinds of bills of exchange.

The element of credit in bankers' and commercial bills—"Prime" bills and others—How the difference between the price of short bills and long bills is figured—The movement, in a fixed relationship, of the price of all the different kinds of bills of exchange.

LESSON V.

The foreign-exchange market.

How and where bills are actually bought and sold—The foreign-exchange "banker"—The exchange "broker"—"Dealers" and the function they perform—New York in its relation to the other American foreign-exchange markets.

Relationship of our own to the foreign money markets.

The American market a chronic borrower—Why this is so—London's peculiar lending facilities—International loans and "free" gold markets—Six per cent in one market and 4 in another.

LESSON VI.

The influence of money rates on the exchange market.

The way in which the money market effects exchange rates illustrated by the concrete example of: (1) A rise in money rates at New York; (2) a decline in money rates at New York; (3) a rise in money rates in London; (4) a decline in money rates in London.

Gold.

What makes gold move internationally—Gold in its relation to trade balances—The market for gold in the United States—In Great Britain—Gold exports and how they are figured—Gold imports and how they are figured—Gold movements which involve more than two markets.

LESSON VII.

Bankers' long bills.

The theory on which long bills are issued—What makes them possible—The ability to draw and sell long bills a privilege seldom abused—Influence of the discount market on the drawing of long bills.

Bills drawn in the regular course of business—Against nondiscountable commercial bills—Against "futures."

Bills originated in the process of loaning foreign money in the American market—How such loans are made—The "risk of exchange"—When assumed by the borrower and when by the lender—Cost of borrowing money abroad—Renewals and how they are effected—Advantage of borrowing in a foreign market—Special considerations.

Finance bills and the theory on which they are issued.

Bills issued to pay for the purchase of securities.

Bills issued to take advantage of the movement of exchange.

Bills issued for capital purposes.

LESSON VIII.

Import and export credits.

The bankers' credit and authorization to draw—The workings of a credit illustrated by an actual transaction carried through its successive stages—The credit and the price of the goods—The merchant's "line"—Issuing and confirming the credit—When issued in dollars and when in pounds sterling—How the shipper uses the credit—Acceptance of the shipper's draft by the bank in London—The documents sent to New York—Terms on which the bills of lading are delivered to the importer—Trust receipts—Special arrangements between banker and client—Prepayments, various bases—Low cost of banker's credit.

LESSON IX.

Import and export credits—Special Forms.

Case where the buyer of the goods can not or will not furnish a banker's credit—Seller himself secures authorization—The banker's protection—Remittance of proceeds—Usance of drafts drawn under such credits—Credits that call for cash payments.

LESSON X.

Dollar credits.

Increase in the use of credits drawn in dollars—Advantages over sterling credits—Elimination of exchange conversions—Commissions saved—Operations made easier—The future of dollar credits a question of ours versus the foreign discount markets.

Dollar and other drafts on foreign points.

Collection of drafts drawn without banker's authorization—Interest and charges usually paid by buyer of goods—Dollar drafts on foreign countries paid in local currency but remitted for in dollars—How the rate of exchange is fixed.

LESSON XI.

Profit possibilities in foreign exchange.

Is the exchange business profitable?—Principal operations of the foreign exchange department—Selling cables against cables, demand against demand, etc.—Selling cables against demand, demand against long, etc.—Three market operations in exchange—Arbitrage—What makes such operations possible?—The speculative element in exchange dealings—Profits *v.* risks.

The silver exchange.

China the last remaining silver-using country of importance—Silver coinage regarded as bullion—Price of silver and the rate of exchange—How the fluctuations in silver prices affect foreign trade—Quoting merchandise prices in silver-using countries.

LESSON XII.

How to convert pounds sterling into United States currency and vice versa.

LESSON XIII.

FIRST HALF OF PERIOD (45 MINUTES).

[Report on and discussion of Withers, "International Finance," Chs. I, II, III, pp. 1-66.]

Finance the machinery of money dealing—Lenders and borrowers—Capital and its claim to reward—Questionable services—Charles the Second's dukedoms—Modern equivalents—Workers and savers.

Money at a bank—Bills of exchange—Finance and industry—Supremacy of bill on London—London's freedom—The Bank of England—The great joint stock banks—The discount market—Bills and trade—Reorganization of the American banking system—America's leading position in international finance.

Stock exchange securities—Government and municipal loans—Machinery of loan issue—Underwriting—The Prospectus—Sinking fund—Bonds and coupons—Registered stocks—Companies' securities—Stock exchange dealings.

SECOND HALF OF PERIOD (45 MINUTES).

Practice in converting—Latin Union—franca, lire.

LESSON XIV.

FIRST HALF OF PERIOD (45 MINUTES).

[Withers, "International Finance," Chs. IV, V, VI, pp. 66-112.]

Why money goes abroad—Trade before finance—Prejudice in favor of home investments—Prejudice against them—The reaction—Mexico and Brazil—Neutral money lenders and the war—Goods and services lent and borrowed—The trade balance.

International finance and trade—Opening up the world—Exchange of products—Finance as peacemaker—Popular delusions concerning financiers—Financiers and the present war—The cases of Egypt and the Transvaal—Diplomacy and finance.

Antiseimetic prejudice—The story of the Honduras loans—The problem to be faced by issuing houses—Their normal obligations, responsibilities, and difficulties—Bad finance and big profits—The public's responsibility.

SECOND HALF OF PERIOD (45 MINUTES).

Practice in converting marks, crowns—Scandinavian Union (Escher-Appendix, p. 196.)

LESSON XV.

FIRST HALF OF PERIOD (45 MINUTES).

[Report on Withers, "International Finance," Chs. VII and VIII, pp. 154-183.]

Danger of overspecialization—Analogy between State and individual—Versatility of the savage—Specialization and peace—Specialization and war—Should the export of capital be regulated?

Regulation of issues by stock exchange committee—Danger arising therefrom—Difficulty of controlling capital—Best remedy is keener appreciation by issuing houses, borrowers, and investors of evils of bad finance—Candor in prospectuses—War as financial schoolmaster—War as destroyer of capital—War as stimulator of productive activity.

SECOND HALF OF PERIOD (45 MINUTES).

Practice in converting rubels, yen, taels—South American currencies.

. STUDY OUTLINE OF FOREIGN TRADE 5.

The two courses in transportation here given should be taken by any students specializing in foreign trade, as well as students specializing in shipping.

OCEAN TRANSPORTATION.

Student's handbook required for each student.

"Ocean Shipping," prepared by the National Foreign Trade Council, New York City.

Document 2112. Public Printer, Washington, D. C.

Government publications.

Jones, Grosvenor M. "Government Aid to Merchant Shipping." 260 pages. Special agents series No. 119.

Study of subsidies, subventions, and other forms of State aid in the principal countries of the world. Government Printing Office, 1916. Price 25 cents.

Arnold, Julian (commercial attaché), "Trans-Pacific Shipping." 30 pages. Miscellaneous series No. 44. Government Printing Office, Washington, D. C., 1916. Price 5 cents.

Report of the Commissioner of Corporations on Transportation by Water in the United States. "Part IV, Control of Water Carriers by Railroads and by Shipping Consolidations." Dec. 23, 1912. Washington, 1913. 100 pages.

For Bibliography of Shipping write to the United States Shipping Board; also to the American Steamship Owners Association, William M. Brittain, M. A., secretary, 17 Battery Place, New York, N. Y.

LESSON 1.—*History of the ocean carrier.*

	References.		
	Book.	Chapter.	Pages.
Classification of sailing vessels. Full-rigged ship. Bark and barkentine. Sloop and schooner. Other types of sailing vessels. History of sailing vessels of the nineteenth century.....	J. & H.... Zim., II..	I-II II	3-31 213-219
Improvement in full-rigged ships.	Kirk.....	I-II	3-23
Development of packet lines.....	Kirk.....	VI	55-64
Development of schooners.....	Kirk.....	VII	64-77
Future use of sailing vessels.			
Development of steamers.....	Kirk.....	V	43-55
Evolution of marine steam engines.....	Kirk..... Kirk.....	VIII XIII	77-98 130-153
Reciprocating engine. Turbine engine. Evolution of the hull, wood to steel.....	Kirk.....	III-IV	23-33
Size and speed.			

LESSON 2.—The classification of steamers by structure and service, unriggered craft, and motor vessels.

	References.		
	Book.	Chapter.	Pages.
Steamships grouped by service	J. & H.... Kirk..... O. S..... Zim.....	III-IV IX II	85-57 98-107 10-11 219-225
Express liners. Combination liners. Cargo liners. Cargo steamers, tramps.....	Kirk..... Kirk..... Kirk.....	X XI XII	108-114 114 120-130
Steamships grouped by deck arrangements: Two-deck vessels. Three-deckers. Spar-deck vessels. Awning-deck vessels. Shelter-deck vessels. Four-deckers and larger vessels. Shade-deck vessels. Turret. Trunk steamers. Whaleback steamers. Self-trimming vessels. Tank steamers. Steam schooners. Motor vessels: Internal combustion oil engine. Diesel marine engine. Vaporizer marine engine. Internal combustion gas engine. Those operated with refined oils. Those operated with producer gas. Unrigged craft: Inland and seagoing barges. Tank barges. Rafts.			

LESSON 3.—Ocean routes.

Routing considerations	J. & H..... Kirk., III..	V-VI I	59-77 285-292
Main ocean trunk line routes	Kirk..... Kirk.....	II III	292-307 307-313
North Atlantic route. Suez Canal route. South African route. South American route. Caribbean routes. North Pacific route. Pacific coast-Australasian route. Panama Canal route.....	Kirk..... O. S..... Kirk.....	V VI	337-348 10-12 348-373
Triangular routes..... Twenty-four trading voyages..... Smith, J. Russell. Part II. Com. Geog., pp. 684-867, 182 pages.	Kirk.....	IV	313-321
The Suez Canal Construction and improvement. Traffic, revenues, and tolls. Value of international commerce. Distances saved. Growth of traffic— To and from regions beyond Suez. To and from Europe. To and from eastern United States, etc.	Kirk.....	V	337-348
Naval and military value Trade route developments from the year 1855.			

LESSON 4.—Canals—Panama, Kiel, Amsterdam, and Manchester.

	References.		
	Book.	Chapter.	Pages.
The Panama Canal.....	J. & H....	VII, VIII	78-109
Origin and acquisition.			
Preliminary problems.....	Kirk.....	VIII	389-397
Sanitation.			
Construction.....	Kirk.....	IX	397-454
Operation.			
Operating rules.			
Economic value.			
Saving in distances and sailing time, reduction in fuel costs, etc.			
Effects—			
On commerce.			
On merchant marine.			
On industries.			
Military and naval value.			
The Kiel Canal:			
Purposes and construction.			
Cost of construction.			
Traffic and tolls.			
The Corinth Canal:			
Construction.			
Financial difficulties.			
Traffic and tolls.			
Inland maritime canals.			
The Manchester Ship Canal.			
The Amsterdam North Sea Canal.....	Kirk.....	X	454-469
Coaling stations.			
The Houston (Tex.) Canal.			

LESSON 5.—The measurement of vessels and the organization of the ocean freight service.

Measurement of vessels:			
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Gross tonnage.			
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Cargo tonnage.			
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Measurement tons.			
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Organization of ocean freight service:			
Freight, passenger, and express service.			
Ocean and rail mail services contrasted.....	Zim.....	I	199
Magnitude of ocean trade and tonnage.			
Kinds of freight transportation services.....	Zim II...	II	219-225
The tramp or chartered service.....	Zim. II..	III	228-236
Regular line service.			
Private or industrial carriers.....	O. S.....		10-11
Business administration of ocean freight service.....	O. S.....		22-27
The freight forwarder.....	Zim. II	IV	238-250
The ship broker.			
Maritime exchanges.			
Port services and agencies.			

LESSON 6.—*Papers and documents of ocean freight service.*

	References.		
	Book.	Chapter.	Pages.
Shipping or shipper's papers:	J. & H....	XII	153-184
Shipping permit.....			
Dock receipt.			
Shipper's manifest.			
Consular invoice.			
Certificate of origin.			
Nondumping certificate.			
Exporter's invoice.			
Statement of charges.			
Memorandum note.			
Ocean bill of lading.			
Through or export bill of lading.			
Charter party.			
Import documents.			
Ship's papers:			
Ship's manifest.			
Bill of health.			
Shipping articles.			
Crew list.			
Ship's register or measurement certificate.			
List of stores.			
Inspection certificate.			
Special documents.			
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LESSON 7.—*Passenger, mail, and international express service.*

Passenger service:	J. & H....	XIII-XV	185-234
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Safety of ocean travel.			
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Classification of passenger services.			
Methods of developing passenger traffic.			
Handling of immigrant traffic.			
Passenger list.			
The ocean mail service:			
Volume of ocean mail.			
Cost of transporting foreign mail.			
Revenues collected in postage.			
Methods of paying steamship companies.			
British mail payments.....	O. S.		85
Mail contract act.			
Payments for noncontract mail service.			
Miscellaneous mail transportation expenses and services.			
International parcels-post service.			
Customs declaration.			
Domestic parcels post service in foreign trade.			
Universal postal union rates.			
Special postal rates.			
Foreign money order service.			
Influence of ocean mail service on ocean transportation.			
The international express service:			
Origin and development of international express service.			
Description of services performed.			
Business organization and arrangements.			
International express documents—			
Express receipt.			
Express bill of lading.			
Export bill of lading.			
Shipping instructions.			
Express expense bill.			
Manifest of articles exported by railway.			
Packing slip.			
Express waybill.			
International express tariffs.			

LESSON 8.—*Marine insurance.*

	References.		
	Book.	Chapter.	Pages.
Marine insurance essential to commerce.....	J. & H. ....	.....	235-259
Liability of rail carriers.....	Kirk., II.	VI	240-257
Limited liability of ocean carriers.			
Plans of marine insurance.			
Lloyd's Association of Underwriters—			
Lloyd's publications.			
Society of Lloyd's Register.			
Other classification societies.			
Insurance companies.			
Self-insurance plans.			
Government marine insurance.			
Development of marine insurance in the United States..			
Risks insured in the United States by American and foreign companies.			
Marine losses or kinds of liabilities.			
Marine insurance policies—			
Essential features of policies.			
Warranties and representations.			
Supplementary clauses.			
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Typical cargo policy.			
Typical war risk policy.			
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LESSON 9.—*Organization of ocean transportation.*

Four aspects of organization.....	J. & H.	XVII-XIX	263-313
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Early trading companies.....	Kirk., II.	I	151-161
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Magnitude of modern steamship lines.....	Kirk., II.	II	161-174
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International Mercantile Marine Co.....	Zim., II..	III	228-239
American International Corporation.			
Business organization of steamship lines.			
Diagram of United Fruit Co.'s organization.			
Private steamship services.			
Evolution of shipping in American trade summarized.			
Monopoly and competition in the ocean transportation service:			
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Financial statement of cargo vessels.			
Financial statement of representative passenger lines.			
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Rates, traffic agreements, pools, and conferences:			
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Other methods of controlling competition between conference lines..	O. S.	73-75
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Panama Canal Act.			
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Railroad facilities at terminals.			
Foreign trade regulations of railroads.			
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LESSON 10.—*Principles of ocean freight rates.*

	References.		
	Book.	Chapter.	Pages.
Ocean line freight rate	J. & H....	XXI-XXII	214-228
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Berth cargo rates.			
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LESSON 11.—Federal aid and general navigation laws of the United States.

	References.		
	Book.	Chapter.	Pages.
Federal aid: National maritime success and progress. Purposes of Government aid. Four general methods of aid in the United States. 1. The Government improves and constructs harbors. 2. It takes various measures to improve the safety of navigation. 3. It seeks to make ocean transportation service profitable. 4. It aids the shipbuilding industry. Tabulation of executive departments and bureaus. Federal harbor improvements (Corps of Engineers).....	J. & H...	XXIII- XXIV	341-373
Bureau of Lighthouses. Geodetic Survey. Steamboat Inspection Service. Bureau of Navigation. Coast Guard. Weather Bureau. Hydrographic Office. Naval Observatory. Increasing the profits of ocean transportation: Federal aid to shipping.			
General navigation laws of the United States..... Navigation laws applied to vessels. Navigation laws applied to officers and crew. Miscellaneous laws..... Operation of American and foreign vessels. Measurement laws..... Load line..... Limitation of liability..... Hydrostatic test..... American and British wages..... Nationality of crew—Appendix H..... Manning of American ships—Appendix H..... British seamen and officers' wages—Appendix J..... Monthly wages of sailors and firemen in British steamers..... Operation of American vessels in foreign trade under the seaman's law..... Crisis in shipping on the Pacific.....	Zim., II..	VIII	312-334
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Administration of navigation laws. Department of Commerce. Commissioner of Navigation. Steamboat Inspection Service. Shipping Commissioners. Bureau of Fisheries. War Department. Treasury Department. Department of Agriculture. Navy Department.			

LESSON 12.—*Governmental regulation.*

	References.		
	Book.	Chapter.	Pages.
Federal regulation of ocean rates.....	J. & H....	XXV, XXVI, XXVII.	376-410
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Free shipping in the foreign trade.			
Liberal interpretation of measurement rules.			
Discount of 5 per cent on import duties.			
Federal ship-purchase plan.			
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General navigation subsidies.			
Shipbuilding subsidies.			
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¹ Canadian aid to shipping, Zimmerman.

LESSON 14—Condition of American shipbuilding industry—The American merchant marine in foreign trade and the merchant marine question.

	References.		
	Book.	Chapter.	Pages.
Condition of American shipbuilding industry.....	J. & H....	XXIX	431-446
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Shipbuilding since the beginning of war in Europe.			
Causes of unfavorable conditions after the Civil War.			
Relative cost of American and foreign-built vessels.			
Causes for higher shipbuilding costs in the United States.			
Fluctuations in the prices of steel.			
Recent cooperation of shipbuilding and steel industries.			
Labor costs.			
Large scale production in foreign countries.			
Standardization abroad.			
Present conditions and future prospects.			
Future prospects improving.			
Construction bounties undesirable.			
What the Government should do for American shipyards.			
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Importance of private initiative.....	O. S.....		69
Outline of shipping act.			

STUDY OUTLINE OF FOREIGN TRADE 6.

PORTS AND TERMINAL FACILITIES.

Reference works:

Jones, Grosvenor M.—

"Ports of the United States." Miscellaneous Series No. 33. Report on Terminal Facilities, Commerce, Port Charges, and Administration at Sixty-eight Selected Ports. Department of Commerce. Bureau of Foreign and Domestic Commerce. Government Printing Office, 1916. Price, 75 cents.

"Pilotage in the United States"—Summary of Laws and Regulations Relating to Pilotage in the Several States. Special Agent Series No. 136, Department of Commerce, Bureau of Foreign and Domestic Commerce, Washington, D. C. Government Printing Office, 1917. Price, 15 cents.

"Water Terminals." Reports of the Commissioner of Corporations on Transportation by Water in the United States, Part III. Washington, Government Printing Office, September, 1910. Price, —.

"Selected Bibliography of Ports and Harbors," issued by the American Association of Port Authorities, 1916. (To be had from the Secretary of the Society in New York, No. 110 West Fortieth Street.)

LESSON I.

The nature of the problem.

What is a terminal?

What do we mean by terminal facilities?

Terminology.

What is a port? wharf? pier? slip? quay? dock?

The relative importance and physical characteristics of the world's leading ports.

Statistics of world's important ports.

- 1. Distance from the high seas.**
- 2. Roadsted ports.**
- 3. The range of tide.**
- 4. The depth of channel.**
- 5. Port improvement.**
- 6. The efficiency of a port is not its size.**

Comparison of port layouts.

Study of maps of Hamburg, Antwerp, London, Tillbury Docks, Rotterdam, Manchester, Bremerhaven, Bremen, Bordeaux.

General characteristics of a well-coordinated seaport.

The reservoir principle.

Freight movement at a port.

Mooring posts.

Port movement of inbound freight (with drawing).

LESSON II.—Port competition for rail and maritime freight.

Geographical advantages in port competition.

The load factor.

Grain exports and freight rates structure.

Canadian ports in competition with New York and other American ports.

Statistics of export grain movement.

The Georgian Bay ports—Depot Harbor, Midland Harbor, Tiffin, Port McNicoll Harbor, Port Colborne.

Gulf port competition.

Special port tariffs.

Import rail rates in the United States.

Freight solicitation.

LESSON III.—The harbor belt railway and competition at the terminals.

Railroad competition and terminal charges.

The harbor belt railway line at Montreal, San Francisco, New Orleans, Philadelphia, Seattle.

The belt railroad at European ports—Rotterdam, Hamburg, Bremen, Emden, London, Liverpool, Antwerp, Manchester.

Separation of terminal charges from the line-haul rate.

LESSON IV.—Lighterage.

Lighterage at New York.

The public lighter.

The usual equipment at New York.

Wharfage on lighters.

Lighterage at other ports.

Waterside delivery by lighter at Hamburg.

Application of waterside delivery to United States ports.

New York lighterage a substitute belt line.

New York-Manhattan lighterage.

Commerce of sections of the port at New York.

The history of free lighterage.

The New Jersey lighterage case.

Needs for union lighterage service.

Cost of delivering railroad freight at New York.

Bush, flottage cost.

Bush, lighterage cost.

LESSON V.—Cartage.

Cartage congestion at New York.

Cartage congestion at Chicago.

Lesson from the Chicago situation.

Markets.

Cartage remedy at New York.

Store-door delivery.

Objections to store-door delivery.

The vehicular tunnel.

The motor truck.

The C. C. Williams formula.

The Union cartage idea.

The removable body.

Draying at Liverpool.

LESSON VI.—*Piers, wharves, and quays and their equipment.*

Engineering features.
 Life of structure and obsolescence.
 Fire risks.
 Wharf equipment.
 Size of transit shed.
 Harding calculation of necessary shed capacity.
 Unbroken floor space.
 Railroad freight.
 Car tracks.
 Location of tracks.
 Team and motor trucks.
 The two-decked pier.
 Length of piers.

LESSON VII.—*Cargo transfer and handling.*

Side-port discharge and water level.
 Portable conveyors.
 Cargo transfer.
 1. Ships' tackle.
 2. Cargo masts.
 3. Cranes.
 4. The number of cranes required.
 Relation of crane to shed.
 . Relation of cranes to railroad tracks.
 Cranes needed to handle barge cargo.

LESSON VIII.—*Shed equipment.*

The hand truck.
 The electric truck.
 Trailers.
 Skids.
 Handling imports subject to duty.
 The Telfer or overhead monorail trolley.

LESSON IX.—*The warehouse.*

The economic function of the warehouse.
 The amount of warehouse space required.
 Fiscal aspect of the warehouse.
 The construction details of warehouses.
 New Orleans cotton warehouses.
 The many-storied warehouses.
 Freight handling and shipping in relation to the warehouse.
 Rail connection.
 Warehouse location with respect to the wharves.
 Storage sheds of the Cresson system.
 Foreign warehouses—London, Rotterdam, Liverpool.
 Warehouse ownership and operation at Hamburg.
 The mixed corporation principle.
 Other examples of municipal cooperation in storage warehouses.

LESSON X.—*Standard package or specialized freight.*

Transfer movement of box freight.

Banana unloading.

Vertical belt conveyors.

Horizontal conveyors and tiering.

Telfer for horizontal conveying.

Telfer system Chalmette Sugar Refinery, New Orleans.

BULK FREIGHT.

Coal and ore.

Special carriers.

Unloading coal or ore.

Development of bulk cargo unloading.

Belt unloaders.

Unloading from steamer to freight cars.

Loading ocean-going vessels.

Bulk storage.

Stock pile—The stock pile a bulk warehouse.

Stock pile foundations.

Ship bunkering.

Grain transfer in stream.

Grain piers.

Grain elevators.

Description of the municipal grain elevator at New Orleans.

LESSON XI.—*Inland waterways and the seaport.*

The importance to a seaport of inland navigation.

Not waterways v. railways.

The river port of Mannheim.

The river port of Duisburg.

Competition among river ports.

Barge terminals.

A commercial port on a canal.

Mississippi ports and the water-level problem.

LESSON XII.—*The industrial harbor and upland development.*

The cost theory and the productivity theory of land value.

A formula for the dilution of the costs of waterways improvements over a large upland area.

Character of industries interested in water connection.

The mechanical problem of the upland connection.

Side-arm canals.

Bulkhead connections.

Mechanical devices for upland connection.

Industries requiring heavy duty transfer service.

Light duty.

Light special duty.

Description of monorail connection for cotton bales at Texas City.

Newark Bay, Jamaica Bay, and others capable of side-arm connection.

A model inland commercial and industrial port (with drawings).

LESSON XIII.—*The free port as an institution and the laws, etc., by which the free ports of Hamburg and Bremen were created.*

Definition of a free port.

Geddes's list of free ports.

Consignment and reexport.

The free ports and the load factor.

The consignment market and local industries.

The free port and bonded warehouses.

Drawbacks, manufacturing in bond and in the free port.

Duty, drawbacks.

Manufacturing in bond.

Other considerations.

Commercial advantage to the city having a free port.

Laws, decrees, and agreements by which the ports of Hamburg and Bremen created their free zones.

LESSON XIV.—*Administration.*

Refer to Johnson and Huebner, "Principles of Ocean Transportation," Chapter X, pages 126-143. "Port and Terminal Charges," Chapter XXVII, pages 403-410.

Ports grouped according to administration, page 130.

Public ports, page 131.

Semipublic ports, page 132.

Public trust ports, page 134.

Private ports, page 134.

Port administration abroad, page 135.

Reference: Jones, Grosvenor M. "Ports of the United States." Introduction. This, together with the introductory remarks concerning ports, will give a fairly comprehensive idea of the problems of administration.

Look up the paragraph under each port which has to do with the administration of the ports of the United States.

(The work of looking up the administration of various ports may very well be assigned to sections of the class for outside work. Individuals or groups may be assigned to study ports or phases of port administration for their special research and report.)

STUDY OUTLINE OF FOREIGN TRADE 7.

TARIFFS AND COMMERCIAL POLICIES.

Syllabus prepared by Mr. L. Domeratzky, tariff expert, Bureau of Foreign and Domestic Commerce, Washington.

***Reference works.*—Selected bibliography:**

Taussig, F. W., *Principles of Economics*. Macmillan, 1915.

Fisk, Geo. M., *International Commercial Policies*, 1907. Macmillan.

Brown, Harry Gunnison, *International Trade and Exchange*. Macmillan.

Foreign and Home Law (Unit X in *Course on Foreign Trade*), Chapter XII.

Day, Clive, *A History of Commerce*.

Ashley, Percy, *Modern Tariff History*. John Murray, London, 1910.

Taussig, F. W., *The Tariff History of the United States*. Putnam.

Modern Tariff Systems, United States Department of Commerce and Labor, 1904.

Tariff series—

Nos. 7 and 7A (*Customs Tariff of the German Customs Union—with supplement*) 1911-12.

Nos. 25 and 25A (*Customs Tariff of France—with supplement*) 1910-12.

No. 34 (*Tariff Systems of South American Countries*) 1913.

No. 38 (*Tariff Relations between Germany and Russia—1890-1914*). 1918.

(Nos. 7, 7A, and 25, published by Bureau of Manufactures, now Bureau of Foreign and Domestic Commerce; 25A, 34, and 38 published by Bureau of Foreign and Domestic Commerce, Department of Commerce.)

Moore's *Digest of International Law*, volume 5, chapter 17.

Hornbeck, S. K., *The Most-Favored-Nation Clause in Commercial Treaties*. 1910.

Laughlin, J. L., and H. Parker Willis, *Reciprocity*. 1903.

Annals of the American Academy of Political and Social Science: Tariff Revision, September, 1908; *Tariffs, Reciprocity, and Foreign Trade*, May, 1907.

Foreign Tariff Notes Nos. 1-28.

Treaties, Conventions, International Acts.

Tariff Acts, 1789 to 1909.

"*Reciprocity*" *Treaties—Favored-Nation Clauses*, Senate Document No. 29, Sixty-second Congress, first session.

Tariff Negotiations Between the United States and Foreign Governments, House Document No. 956, Sixty-first Congress, second session.

Higginson, J. H., *Tariffs at Work*. King & Son, London, 1913.

LESSON I.

Modern Tariff Systems, Department of Commerce and Labor.

Fisk's International Commercial Policies, Chapters V-VIII.

Foreign and Home Law (unit X in Course on Foreign Trade), Chapter XII.

Classification of tariffs.

Character of customs duties.

Import duties.

Export and transit duties.

Import, export, and transit prohibitions.

Free lists.

LESSONS II AND III.

Rutter's Tariff Systems of South American Countries.

Character of South American tariff systems:

Protection and revenue.

International relations.

Valuation system.

Class-rate system.

Specific tariffs.

Brazilian tariff.

Dutiable weight and value.

Special features of South American tariffs.

Customs duties and charges:

Level of duties.

Surtaxes.

Supplementary taxes.

Customs charges.

Customs procedure:

Consular documents.

Entry.

Appraisement.

Penalties.

Classification and appeals.

Miscellaneous features.

LESSON IV.

Taussig's Principles of Economics, Chapters 34-37.

Brown's International Trade and Exchange, Chapters III-VII.

Economic basis of tariffs:

Free trade and protection.

Incidence of revenue tariffs.

Effect of protective tariffs on national wealth.

Effect of protective tariffs on distribution of wealth.

Arguments for protection.

Arguments for free trade.

Bounties and subsidies as contrasted with tariff protection.

LESSON V.

Fisk's International Commercial Policies, Chapters II-IV.
Day's History of Commerce, Chapter XVIII.

Commercial policy.

Mercantile system.

General characteristics of mercantilism.

First and second phases.

Third phase.

Criticism of mercantilism.

Development of modern commercial policies.

The physiocratic system.

Free trade system.

Protective system.

LESSON VI.

Fisk's International Commercial Policies, Chapters XI and XII.

Commercial treaties.

Definition.

Development.

European.

Duration.

Subject matter.

Classification.

Provisions.

LESSON VII.

Commercial treaties (continued):

Reciprocity.

American reciprocity treaties.

Interpretation of most-favored-nation clause.

American.

European.

LESSON VIII.

Taussig's Tariff History of the United States, Part I.

Modern tariff history:

Tariff history of the United States to Civil War.

Protection to young industries as applied in the United States.

The early protective movement and the tariff of 1828.

The tariff 1830-1860.

LESSON IX.

Taussig's Tariff History of the United States, Part II.

Modern tariff history (continued):

United States tariff legislation 1861-1913.

The war tariff.

The failure to reduce the tariff after the war.
 How duties were raised above the war rates.
 The tariff act of 1883.
 The tariff act of 1890.
 The tariff act of 1894.
 The tariff act of 1897.
 The tariff act of 1909.
 The tariff act of 1913.

LESSON X.

Ashley's Modern Tariff History, Part I.
 Tariff Series Nos. 7 and 7A.
 Tariff Series No. 38.

Modern tariff history (continued) :

Tariff history of Germany—

The formation of the Zollverein.
 The beginnings of protection and the first crisis.
 The second crisis and the commercial treaties.
 The Zollverein after the treaties—The completion of free trade and the reaction.
 The attitude of the economists.
 German commercial policy to 1894.
 The revival of the protectionist movement, and the new general tariff.
 Recent economic discussion in Germany.
 The commercial treaties and the new conventional tariff—conclusion.

LESSON XI.

Ashley's Modern Tariff History, Part III.
 Tariff Series Nos. 25 and 25A.

Modern tariff history (continued) :

Tariff history of France—

French commercial policy from 1789 to 1890.
 The monarchy of July.
 The Second Republic and the Second Empire—The commercial treaties.
 Commercial policy, 1870–1881.
 Protection for agriculture—The Franco-Italian tariff war—Subsequent economic progress.
 The tariff of 1892 and subsequent developments.
 The tariff of 1910.

STUDY OUTLINE OF FOREIGN TRADE 8.

EXPORT COMBINATIONS AND THE "WEBB LAW."

An advanced course in sales methods. Prerequisite foreign trade 1 (sales practice), or the course of the business training corporation, New York, or one year of practical experience in an export department actually engaged in conducting a foreign business.

Texts:

Federal Trade Commission. Report on "Cooperation in American Trade," in two parts. June 30, 1916, Washington, D. C., Government Printing Office. \$1.15.

Reference:

Snow, Chauncey Depew, assistant chief of the Bureau of Foreign and Domestic Commerce. "German Foreign Trade Organization." Miscellaneous Series No. 57, Government Printing Office, Washington, D. C. 1917. Price, 20 cents.

Wolfe, Archibald J., commercial agent, Department of Commerce. "Commercial Organization in Germany." Special Agent's Series No. 78, Government Printing Office, Washington, D. C. 1914.

Guaranty Trust Co. of New York. Pamphlet, "Combination in Export Trade under the Webb Law" (with text of the law); ("Export Trade Association Act") on request from the Foreign Trade Department.

National Bank of Commerce in New York. "Export Trade Association" idem.

Hauser, Henri, professor at the University of Dijon, France. "Les Methodes Allemands." English translation by Manfred Emanuel. "Germany's Commercial Grip on the World," "Her Business Methods Explained."

Instructions.—The amount of assigned and collateral reading is greater than can be well covered between the lessons. It is, therefore, advisable to assign to individuals or groups only certain of the subjects in the text or in the recommended reading for study and report. Reports should be made from notes, and should not be longer than 10 minutes and should form the subject for discussion in the class. The assignments are left to the discretion of the instructor in the outline. The outline is almost entirely according to the outline of the textbook.

LESSON 1.

Read in the class and discuss the text "Summary," page 3-10. "Conclusions," page 370, Chapter VI. And the "Export Trade Associations Act" (Webb law), pamphlet, Guaranty Trust or National Bank of Commerce.

LESSON II.

Character and importance of American foreign trade (Ch. II, p. 17-24).

Section 1. Character of American trade.

Section 2. Importance of the foreign trade—Foreign capital—Foreign services—Foreign manufactures—Foreign foodstuffs and manufacturer's materials—Broader markets.

General competitive conditions in international trade (Ch. III, 25-39).

Section 2. Transportation facilities—Railroads—Ocean shipping—The merchant marine of the chief trading nations, Great Britain, Germany, France, Japan—Other foreign nations—United States—Need of American ships for foreign trade—Dependence on foreign ships—Need of American ships to stimulate foreign trade—Shipping lines controlled by foreign exporters—Delay and irregularity in shipments of American exports—Americans charged higher freights—Assertion that foreign shippers are given information of the transactions of Americans.

Section 3. Foreign banking and credit facilities (p. 40-65)—Foreign trade financial organization of the chief commercial nations: Great Britain, Germany, France, Netherlands, Belgium, Portugal, Spain, Switzerland, Italy, Greece, Austria-Hungary, Russia, Japan.—Advantages enjoyed by foreign traders, in facilities for banking, credit, and exchange: Facilities for financing transactions in foreign markets—Extension of credits—Information of business conditions, of credit standing of customers, etc.—Assertions that information is given of transactions of Americans—Direct promotion of sales—American conditions.

LESSON III.

[Ch. III—continued, p. 66-76.]

Section 4. Foreign investments of the chief trading nations—Course and amount of foreign investments—Great Britain—France—Germany—Other countries—Relations of foreign investment to foreign trade.

Section 5. Industrial organization (p. 77-97, Ch. III—continued)—Great Britain—Imports and exports—The board of trade—The commercial department—The commercial intelligence branch—Exhibition branch—The organization of British industry—Chambers of commerce—Trade associations—Combinations in British industry—Spirits—The Distiller's Co. (Ltd.)—The Industrial Spirit Supply Co. (Ltd.)—Distillers' Finance Corporation (Ltd.)—Export policy—Soap—Salt—The Salt Union (Ltd.)—The Northwestern Salt Co.—The British Salt Association—Organization for foreign trade—Export merchants—Export combinations.

LESSON IV.

[With reference reading in Lay Report, Vol. II, Snow, Hauser, and any others, pp. 98-114, Ch. III—Continued.]

Germany—Industrial organization.—Introduction—Character of German foreign trade—Imports and exports—Tariff drawbacks—Trade associations—Combinations in German industries—Kinds of cartels—Selling-terms cartels—Price cartels—Syndicate or selling cartels—A member of the combine as selling agent—A mercantile house or bank as selling agent—A counting house as selling agent—A stock or limited liability company as selling agent—Special cartels and selling agencies for export trade—Cartel arbitration boards—Legislation and decisions of the courts regarding cartels—Attitude of the Government regarding cartels—State participation in cartels—The study of cartels in Germany—Cartels in particular industries—The potash syndicate—Potash law of May 25, 1910—Common selling agency—Concentration within the syndicate—Relation between the syndicate and dealers' combines—Cartels among dealers—Special organization for foreign trade—Export efforts of trade associations—Cartels in export trade—Cooperation among noncompetitors.

LESSON V.

[Special reference to Part II, Thackara Report, pp. 115-146, Ch. III.]

France.—Imports and exports—Promotion of trade by the Government—Tariff provisions—Chambers of commerce—Combinations—Forms of combination—Mergers—Cartels—The *comptoir*—Government regulation of combinations—Export *comptoir*—Combinations in particular industries—Pig iron—Iron and steel products—Sulphur refining—The aluminum industry—*Societe Generale des Papeteries du Limousin*—Salt—*La Compagnie de Saint-Gobain*—Combination and concentration in other industries.

Belgium.—Nature of Belgian products—Commercial organization—Promotion of foreign trade—Forms of combination—Government regulation of combination—Coal industry—Steel industry—Glass industry—Other industries.

Italy.—Nature of Italian products—Imports and exports—Drawbacks—Subventions—Business organization—Forms of combination—Government regulation of combinations—Citrus fruits—Sulphur—Causes that led to formation of compulsory syndicate—Law of July 15, 1906—Law of June 30, 1910—Agreement between Italian and American sulphur interests—Effects of the compulsory syndicate—Lime and cement—Superphosphate—Sugar syndicate.

Switzerland.—Introduction—Export associations—Embroidery industry—Silk industry—Watch industry—Chocolate industry—Condensed milk—Machinery—Cheese syndicate.

LESSON VI.

[Ch. III, continued, pp. 147-164.]

Japan.—Introduction—Government encouragement and protection of industry and trade—The higher council of agriculture, commerce, and industry—Guilds—Inspection of foreign markets—Commercial sample museums—Societies for promoting international trade—Registration of patents and trade-marks—Drawbacks and rebates—Large trading companies—Japan's colonial trade—Cooperation between American manufacturers and Japanese merchants—Conditions in particular industries—Raw silk—Tea—Sake—Matches—Toys—Matting—Other countries.

Russia.—Government sales of agricultural machinery.

Austria-Hungary, Sweden, The Netherlands, Canada.—The Export Association of Canada (Ltd.).

United States.—Tariff drawbacks—Department of State—Bureau of Foreign and Domestic Commerce—Commercial organizations for promotion of foreign trade.

LESSON VII.

[Ch. IV, pp. 165-198.]

Competitive Conditions in South American Trade.

Section 1. Introduction.

Section 2. Present conditions in South American trade abnormal.

Section 3. The need of American shipping to carry American goods.

Section 4. The influence of foreign investments on the demand for foreign goods.

Section 5. The competition from foreign combinations.

Section 6. The need of American distribution of American goods.

Section 7. The advantage of cooperative action by American producers in South American trade.

Section 8. Combinations of producers in South America.

Section 9. The cacao association—The valorization of coffee—Combinations of producers in South America—The quebracho combination—The iodine combination.

LESSON VIII.

[Ch. V, pp. 199-244.]

Section 1. Introduction.

Section 2. Iron and steel.—Blast furnace and rolling-mill products. Germany (see Lay Report, Pt. II): Iron—The pig iron syndicate—Steel—The Stahlwerksverband. Great Britain: The Scotch Steelmakers' Association—The National Galvanized Steelmakers' Association—South Wales Siemens Steel Bar Association—Combinations in marked and unmarked malleable-iron bars—British Rail Makers' Association. Belgium: Early combinations—The Comptoir des acieries belges—Other combinations. France: Comptoir Metallurgique de Longwy, and Comptoir d'Exportation des Fontes de Meurthe-et-Moselle—Special Comptoirs for iron and steel products. Austria-Hungary, Russia, Italy, United States: Existing cooperation—Proposed cooperation—Machinery and railroad rolling stock. Germany: Machine tools—Shoe machinery—Pump machinery—Railway rolling stock—Typewriters—Sewing machines—Bicycles. Great Britain, France, Russia, United States: Existing cooperation—Proposed cooperation.

Section 3. Textiles—Introduction.—Great Britain: The merchandising of cotton. Combinations among manufacturers—The Fine Cotton Spinners' and Doublers' Association—The Coat Combination—The English Sewing Cotton Co.—American Thread Co.—Position of J & P Coats Co. in recent years—The Linen Thread Co.—Textile dyeing—The Bradford Dyers' Association (Ltd.). Germany: Combinations—Trade Associations Cartels—Spinning—Weaving—Embroidery and lace industry—Zanella and serge—Jute—Cloth—Silk. France: The cotton-twist combination—Restriction of output—Export bounties—The comptoir for cotton prints—Flax, hemp, and two spinnings (Syndicat des Filatures de Lin, de Chanvre et d'Etoupe de France). Italy: The Istituto Cotoniero Italiano—The silk industry—Flax and hemp industry. Belgium: Association Cottonniere de Belgique—The Association Belge de Tissage—Combinations in the Orient—Japanese competition in China—Japanese combinations—The Cotton Fabric Export Syndicate—The Manchurian Cotton Exporters' Association—Combinations in China—Cooperation among American manufacturers for export trade—Cooperation in competing lines—Cooperation in kindred lines—Advantages of cooperation for export trade.

LESSON X.

[Ch. V, continued, pp. 272-324.]

Section 4. Electrical goods—Introduction.—Germany: Centralization through communities of interest—The Allgemeine Elektrizitäts-Gesellschaft—Organization—Affiliations with banks and other enterprises—Controlled companies—Agreements covering foreign markets—The Siemens-Schuckert concern—Capital and dividends—Connections with banks—Relations of the A. E. G. and Siemens-Schuckert. Great Britain: British investments in foreign public utilities—Cable, telegraph, and telephone companies—Local utilities other than telephone companies—Combinations for foreign trade—Organization—Purposes—Export activities—Cooperation among American manufacturers.

Section 5. Chemicals.—Germany: Coal-tar dyes—Entire industry controlled by two groups—The Badische group—The Höchst-Casella group—General results of concentration—Profits—Soda—Alcohol—Effectiveness of the combinations—France—Italy—Great Britain and other countries—Cooperation in American export trade in chemicals—Advantages of export cooperation.

Section 6. Phosphate rock.

Section 7. Portland cement—Introduction.—Germany, Great Britain: The Associated Portland Cement Manufacturers (Ltd.)—The British Portland Cement Manufacturers (Ltd.). Belgium: Other countries—International combinations—Cooperation among American producers.

Section 8. Lumber.—The American export trade in lumber—Cooperation in the lumber export trade—Advantages and disadvantages of proposed export combinations of lumber producers.

LESSON XI.

[Ch. V, pp. 325-346.]

Section 9. Coal—Introduction.—Germany: The Rhenish-Westphalian Coal Syndicate—Organization—Production—Selling arrangements and price policies—The coal syndicate and coal transportation on the Rhine—Upper Silesian coal convention. Belgium, France, Great Britain: The Cambrian coal combine—Cory Bros. & Co. (Ltd.)—The Wilson Interests—Great Britain and the United States in South America—British investments in South America—Control of transportation, docking, storage, and distributing facilities by Great Britain—High quality of American coals suitable for export—American coal cheaper at tidewater—Transportation and handling facilities—Cooperation among American producers—For bunker and export business.

LESSON XII.

[Ch. V, continued, pp. 347-369.]

Section 10. International combinations—Chemicals—Iron and steel—Metals other than iron and steel—Glass—Plate glass—Bottles—Petroleum.

Section 11. Combinations of foreign buyers—Cooperative societies in the United Kingdom—The Scottish Cooperative Wholesale Society (Ltd.)—The Cooperative Wholesale Society (Ltd.)—Principal articles purchased in the United States—Buying combinations in the metal market—Close interrelation of producers, traders, and larger consumers—Silver—Copper—Zinc—Lead—Aluminum—The German metal-buying combination—The Metallgesellschaft, Metallbank und Metallurgische Gesellschaft, and H. R. Merton & Co. (Ltd.)—The Deutsche Gold-und Silberscheideanstalt—Aron Hirsch und Sohn—Beer, Sondheimer & Co.

CONCLUSIONS.

[Ch. VI, pp. 370-380.]

Section 1. Statement of the problem.

Section 2. The findings of fact.—Foreign combinations that affect American export trade—The need of cooperation in American export trade—Safeguards for domestic consumers and competing producers—Doubt as to the law now prevents export cooperation.

Section 3. Recommendations of the commission.

List of authors cited, page 383.

STUDY OUTLINE OF FOREIGN TRADE 9.

HISTORY OF COMMERCE.

Although it may not be possible to include a study of international trade by the historical method in a short-term evening school, the importance of the study of the origin and growth of the world's commerce must not be minimized. To understand the significance of present events and to gain at least a partial perspective in contemplating commercial changes close at hand it is necessary to see them against an historical background. A course in the history of commerce is an essential element in any complete foreign-trade curriculum for colleges.

Reference: Johnson, Emery R., Van Metre, T. W., Huebner, G. G., and Hanchett, D. S., "History of Domestic and Foreign Commerce of the United States," two volumes. Published by the Carnegie Institution of Washington, D. C. 1915.

History of commerce.

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SUGGESTED STUDY PLANS.

STUDY PLAN A.

Six studies, 3 evenings, for 15 weeks.

This intensive course of studies will require almost the entire time of student out of office hours.

	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
6-7.30	Selling methods.....		Foreign exchange.....		Export combinations.
8-10	Documents.....		{Shipping, 8-9.10.....		Commercial geography.
			{Ports, 9.15-10.....		Staples.

Language evenings should be postponed until after course is completed wherever persons taking the course are able to do so. (10½ points.)

STUDY PLAN B.

Minimum, 5 subjects, 2 evenings, 15 weeks.

	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
6-7.30		Selling methods.....		Foreign exchange.....	
8-10		Documents.....		{Shipping, 8-9.10.....	
				{Ports, 9.15-10.....	

Language on other evenings. (7 points.)

STUDY PLAN C.

Maximum, 4 full evenings, 15 weeks.

Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
Selling methods....	Foreign exchange...	Ports.....	Export combinations (with law).	History of commerce.
Documents.....	Marine insurance....	Shipping....	Tariffs and treaties.....	Staples.

NOTE.—In the place of marine insurance a general course on "The Shore Operation of Ships" will soon be available.

It would be impractical for any person working full office hours to attempt to carry such a schedule. However, a school could offer all these courses for choice. The selection would be made on the basis of the student's previous experience and knowledge. By offering the course twice during the year and language classes on carefully selected evenings the student could take all of the courses in two terms and a language besides. By offering the courses twice, those who have immediate need for certain studies would be served.

STUDY PLAN D.

Minimum, 2-term schedule, 30 weeks, 2 evenings.

FIRST TERM.

	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
6-7.30		Foreign exchange.....		Ports.....	
8-10		Staples.....		Shipping.....	

Intensive language study; conversation and commercial correspondence or other evenings. (Native teacher.)

SECOND TERM.

	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
5-7.30		Export combinations..		History of commerce..	
8-10		Documents.....		Selling.....	

(14 points.)

Intensive language study other evenings.

NOTE.—This arrangement is for 1918-19 only, and is due to the impossibility of certainty of procuring from the printer the texts on "documents" and "selling" in time to start the term on schedule.

STUDY PLAN E.

Two terms, 3 evenings, 30 weeks, 21 points and languages.

FIRST TERM.

Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
Shipping and ports..... Staples.....	A language...	Shipping and ports.... Staples.....	A language...	Foreign exchange; Tariffs and treaties.

SECOND TERM.

Selling methods..... Document.....	A language...	Selling methods..... Document.....	A language...	History of commerce. Export combinations.
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(Minimum for certificate, 21 points.)

PUBLICATIONS OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

[Those marked with an asterisk deal with emergency war training for conscripted and enlisted men.]

Annual Report for 1917.

The Vocational Summary, published monthly by the Federal Board for Vocational Education. (Vol. 1, No. 1, May, 1918.)

Bulletin No. 1. Statement of Policies.

***Bulletin No. 2. Training Conscripted Men for Service as Radio and Buzzer Operators in the United States Army (International code).**

Bulletin No. 3. Emergency Training in Shipbuilding—Evening and Part-Time Classes for Shipyard Workers.

***Bulletin No. 4. Mechanical and Technical Training for Conscripted Men (Air Division, U. S. Signal Corps).**

Bulletin No. 5. (Reeducation Series, No. 1.) Vocational Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 166.)

Bulletin No. 6. (Reeducation Series No. 2.) Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 167.)

***Bulletin No. 7. Emergency War Training for Motor-Truck Drivers and Chauffeurs.**

***Bulletin No. 8. Emergency War Training for Machine-Shop Occupations, Blacksmithing, Sheet-Metal Working, and Pipe Fitting.**

***Bulletin No. 9. Emergency War Training for Electricians. Telephone Repairmen, Linemen, and Cable Splicers.**

***Bulletin No. 10. Emergency War Training for Gas Engine, Motor Car, and Motor Cycle Repairmen.**

***Bulletin No. 11. Emergency War Training for Oxy-Acetylene Welders.**

***Bulletin No. 12. Emergency War Training for Airplane Mechanics—Engine Repairmen, Woodworkers, Riggers, and Sheet-Metal Workers.**

Bulletin No. 13. (Agricultural Series, No. 1.) Agricultural Education—Organization and Administration.

Bulletin No. 14. (Agricultural Series, No. 2.) Reference Material for Vocational Agricultural Instruction.

Bulletin No. 15. (Reeducation Series, No. 3.) The Evolution of National Systems of Vocational Reeducation for Disabled Soldiers and Sailors.

***Bulletin No. 16. Emergency War Training for Radio Mechanics and Radio Operators.**

Bulletin No. 17. (Trade and Industrial Series, No. 1.) Trade and Industrial Education—Organization and Administration.

Bulletin No. 18. (Trade and Industrial Series, No. 2.) Evening Industrial Schools.

Bulletin No. 19. (Trade and Industrial Series, No. 3.) Part-Time Trade and Industrial Schools.

Bulletin No. 20. (Trade and Industrial Series, No. 4.) Buildings and Equipment for Schools and Classes in Trade and Industrial Subjects.

Bulletin No. 21. (Agricultural Series, No. 3.) The Home Project as a Phase of Vocational Agricultural Education.

Bulletin No. 22. (Commercial Education Series, No. 1.) Retail Selling.

Bulletin No. 23. (Home Economics Series, No. 1.) Clothing for the Family.

Bulletin No. 24. (Commercial Education Series, No. 2.) Vocational Education for Foreign Trade and Shipping.

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BULLETIN No. 25

REEDUCATION SERIES
No. 4

WARD OCCUPATIONS IN HOSPITALS

ISSUED BY THE
FEDERAL BOARD FOR VOCATIONAL EDUCATION
WASHINGTON

December, 1918

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1918

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FOREWORD.

Occupational therapy has amply proved its worth wherever it has been scientifically provided, and increasing importance is being attached to it by physicians in military and other hospitals at home and abroad. It is now universally recognized that occupational work for the convalescent must be suited to the patient's condition and graduated to develop normal functional activities and ultimately normal vocational interests and capacities. Such occupational work provides an essential and scientific means of insuring, so far as possible, in each case, complete and rapid physical, mental, and vocational rehabilitation. Occupational therapy, it is further recognized, must begin in the very first stages of convalescence and must be continuous during the entire period of hospital treatment. Ward occupations must graduate into the more strenuous hospital workshop employments, the patient being thus graduated out of the hospital by easy stages into the vocational training school or directly into practical vocational employment. An analysis of recent experience in military and other hospitals is given which undertakes further to indicate possible lines of future development. The extent to which hospital ward occupations can be given a vocational value is one of the important issues discussed.

This bulletin was prepared by Miss Elizabeth G. Upham, under direction of Charles H. Winslow, Chief of the Research Division of the Federal Board for Vocational Education. Acknowledgement for valuable help and suggestions is made to Dr. William L. Russell, of Bloomingdale Hospital, White Plains, N. Y.; and to Norman L. Burdette, of the Invalided Soldiers' Commission, Toronto, Canada; and for editorial assistance to Dr. John Cummings, of the Research Division of the Federal Board.

C. A. PROSSER, *Director.*

WARD OCCUPATIONS IN HOSPITALS.

IMPORTANCE OF WARD OCCUPATIONS.

Experience in all of the belligerent countries has demonstrated that ward occupations are a necessary part of the process of rehabilitation. The fundamental principle on which they have been developed is that the men need to have their time occupied. This principle may be accepted as an axiom.

The problem is, then, to determine how that time may be occupied to the patient's best advantage. If occupying time means merely "busy work" and is nothing more than time passing and diversional, assuming that its therapeutic justification lies in an improved mental outlook reacting upon physical conditions, then any occupation may be acceptable.

If, however, the question arises how may time while being occupied be made also of social and economic value to the patient ward occupations must be analyzed both from the standpoint of their therapeutic and also their recreational, vocational, or educational possibilities.

Therapeutic results can be achieved best when directed by one trained in the service. As ward occupations are designed for men so ill that they are unable to follow a regular course of work the teaching must take the nature, to a very large extent, of a diversion. It requires patience, tact, sympathy, and persuasion to induce many patients to undertake an occupation at this early time, and in this art women¹ make the best occupational therapists, just as they make the best nurses.

This phase of ward occupations may be contrasted with later stages of training in the curative workshops and reeducation schools where men, and particularly returned men with technical and practical experience, make the best instructors.

Ward occupation in the past has been considered the least important step in rehabilitation, as being apparently only remotely connected with technical training and placement in industry, but it is beginning to be considered most important, as experience is proving that the later steps can succeed only as ward occupations have

¹ The Surgeon General has called for 2,000 women for reconstruction aides in occupational therapy for overseas service. *Carry On*, vol. 1, No. 3, p. 20.

inspired the will and developed the concentration and application to "carry on."

So important does Dean Allen Cullimore, of Delaware College, feel that occupation is at this early stage of convalescence that he says:

This assignment [ward occupation] should take place at the latest on the next day following his arrival at the hospital * * * an interval of a week in idleness is fatal.¹

It has been said that the handicapped become employable in direct ratio to the promptness with which occupation is begun. It is true that the longer the period of idleness the more difficult, if not impossible, the adjustment. Even a short period of idleness tends to hospitalize the patient, and seems to crush his ambition and kill his application. These can not be re-created by later systems of reeducation however elaborate.

Realizing that inspiration and will power are reborn in this early stage and that delay at this time means wasted lives, psychologists and practical educators are more and more turning their attention to the crucial period of ward occupations. Mr. Norman L. Burnette, of Canada, has felt as a result of his experience in directing occupational therapy in the Whitby shops and classes that the problem of reeducation does not begin in convalescence, but extends back into the period when the man is confined to his bed, and when he is developing habits of mind which will influence his entire future career.

On a given day in the Whitby Hospital 507 patients were enrolled; 20 were confined to bed, 96 were engaged in odd jobs about the hospital, 133 attended the schools or shops. The balance of 249 men were not ordered to the shops, and were therefore smoking or playing poker, if doing anything at all. If these men cared so little for training as not to embrace the opportunity when confined to a home, it is reasonable to suppose they will not consent to training on discharge, although many are eligible for it and are unable to pursue their former occupations. Neither laziness nor lack of appreciation of the value of training accounts for the willingness of so many to cast it aside. Rather it is the habit of following the line of least resistance, developed early in hospital days. Spirit, purpose, and interest in a concrete line of work suggested in ward occupations have furnished the incentive for many a patient to take up a line in the curative workshop or class. Statistics in Canada have proved that the men who became interested in the work during convalescence are eager to complete it in the reeducation school. If the occupation is brought to the man at first, the man will later bring himself to the occupation, and thus is solved a most important problem in reeducation. The reeducation school is therefore dependent upon ward occu-

¹ Report on Ward Occupations.

pations not only for its enrollment of students but for the mental and moral fiber with which those students come.

This Canadian experience has been corroborated by Dean Culimore. In speaking of the importance of ward occupations he states in his report:

Let it be understood now, and definitely, that as an engineer primarily interested in the practical results of this training, interested in the proper assimilation of men industrially and economically and socially into our social fabric, having a very definite and intimate point of contact with the disabled men, I believe that the proper conduct of bedside occupation work will bring the greatest practical return to the men interested in quantity and quality of men turned out.

This is said purely on the basis of what I have seen and what I know. I have no brief whatever for this phase of the work. It is that branch where I could personally serve least and where my previous experience would function least, but I do feel constrained to say in all seriousness and with a very intimate sympathy with the returned men that the authorities in this and other countries have neglected and are neglecting a phase of the work which is vital, so vital that if it is neglected our results can not and certainly will not transcend those of any other country. * * *

A short acquaintance with the training of crippled soldiers brings out the fact that the most critical time in the real development of the man is the period spent in bed. It is therefore of primary importance that this phase of the work receive the attention which it warrants.

THERAPEUTIC VALUES OF WARD OCCUPATIONS.

Inasmuch as the patient is in the hospital for medical treatment, his physical condition is of primary concern, and ward occupations may therefore be studied first for their therapeutic values. Ward occupations, from the medical point of view, have both psychological and physiological possibilities.

PSYCHOLOGICAL VALUES.

"Improved mental condition" is the therapeutic claim for ward occupations. This improved mental condition is generally thought to be brought about by an occupation which diverts the patient's attention from his wounds and suffering and gives him a brighter outlook upon life.

The disabled man usually returns with one of two attitudes—either "I have done my bit" or "I am no good." Ward occupations are invaluable in overcoming both of these attitudes. In the first case ward occupations may give the incentive that there is work to do; that he must still "carry on"; and that the second battle field before him is no less glorious than the first, and is of no less service to his country. If he returns with the feeling that his usefulness is over and that he is no longer fit for anything, ward occupations are invaluable in proving to him that there is something he can do and that a world of possibilities lies ahead of him.

Dr. J. Roddick Byers, of Laurentide Inn, St. Agathe, Quebec, Canada, lays great stress upon the contentment which occupation brings in dealing with long convalescent cases. During the first six months at Laurentide Inn for tubercular patients 15 per cent of the men proved insubordinate and 33 per cent found treatment so intolerable that they refused it, waiving all claims upon the Government. Dr. Byers knew from his own experience that convalescence can be made a period of profit and interest. He therefore instituted classes and workshops in connection with Laurentide Inn. The result was that during the past six months only 0.05 per cent of the men proved insubordinate and not one refused treatment.

Diversion and contentment may entirely justify ward occupations, but "improved mental condition" should include more. It should comprehend a definite development and reorganization of mental processes, and this requires a constructive and progressive method of treatment.

In order to improve a patient's mental condition it is necessary first to make a careful mental diagnosis. This may be the result of an early survey, but is probably not accurately confirmed until the patient has been under occupational treatment and observation in the ward to determine his mental reactions and methods of work. Then, and then only, is it possible to know the mental fabric upon which the occupational therapist has to build and the results that may be achieved. To attempt to normalize mental variations by simply giving the patients occupation indiscriminately is as absurd as to attempt to cure all physical irregularities by the administration of any drug. Occupation must be given only after a careful study for each individual case.

Dr. A. J. Ruggles¹ has said of occupation:

It should be prescribed only after careful medical and physical examination and with as much thought on the part of the physician as he would use in determining whether a given patient needs a vagotonic or sympathicotonic drug. * * * Is it too much to expect that we may have occupation charts showing the types of occupations indicated in certain neuroses and psychoses, and that with them we will have directions for the length of time to be given and symptoms resulting from wrong application?

The instructor in ward occupations stands in the same relation to the medical officer as the pharmacist or nurse. The occupation prescription must be carried out by one who is skilled and has had special training. The prescription should be a matter of consultation with the doctor. In Bloomingdale Hospital, White Plains, N. Y., the directors of occupation for the men and women consult the doctor in regard to every case sent to them for occupational treat-

¹ First assistant physician, Butler Hospital, Providence, R. I.: *The Modern Hospital*, June, 1917.

ment. The result of these consultations is that the doctors give such information as may guide and help the director in selecting the occupation and in the method of presenting and developing it. The doctor is told, in turn, of the patient's reactions and fatigue under work. These consultations form the basis of a systematic line of occupational treatment.

Each process must be adapted to the patient's particular kind and degree of mentality and must be given with the therapeutic purpose in mind. For instance, the stimulating process suited to the languid patient has not the relaxation necessary for the excitable patient. The feeble patient has not the vitality for a process demanding strength and vim necessary for one having excess energy. Processes involving concentration are needed for depressed patients, while monotonous operations with a subduing effect are suited to elated patients. Indifferent patients need processes with interest and variety, whereas restless patients require those with continued application.

Almost any of the so-called ward occupations holds a variety of processes. Basketry as it is ordinarily taught is chiefly diversional. When basketry is scientifically taught by an instructor with therapeutic values in mind, the patient who has initiative, but is perhaps restless and excitable, is given the monotony of a simple stitch on a large piece of work for a fairly long period of time in order to secure mental poise and relaxation. The patient who wearies quickly needs shorter and more frequent intervals of work, with a number of small pieces which have variety enough to hold attention, but which are sufficiently alike to permit the corrective effect of continued application. The patients are like children—they quickly lose interest and put aside their work. The patient who is content to stay in a rut and who will make the same thing over and over again is the very one who should have a variety which leads to more and more complicated processes of execution and thought. The well-trained instructor watches for the psychological moment when a bit of bright-colored raffia may attract the attention of the indifferent patient. That patient's conscious or unconscious reaction is the first step. However slow the progress may be, and however little of it is the patient's own effort, each motion is nevertheless a definite gain. The moment a patient advances so far as to have an inclination or to express a choice of pattern, then something more than decision is ready to develop. Execution logically follows decision, and a host of mental forces are at work. These may be dissipated or centered, as the case may be, in many different ways.

The correct approach to the patient and the development of the occupation are fundamentally necessary in securing therapeutic results. The length of time a patient should be kept at one kind of work, the rate of his progress, or type of change in work, require trained

judgment. The therapeutic value of an occupation is gone to some patients the moment the occupation is fully mastered, and recovery is measured by the systematic change from occupation to occupation, each demanding more initiative and concentration. On the other hand, the continued practice of an occupation long after its mastery gives to other patients just that poise and self-confidence essential to recovery. It is just this understanding of the possibilities of every type of work and the well-timed change of occupation in close co-operation with physical variations which can make this work truly therapeutic and prevent it from being merely negative or time killing.¹

In speaking of an intelligent understanding of the possibilities of occupation for good and harm, Dr. A. J. Ruggles has said:

We would not think of letting our nurses graduate without a practical knowledge of the effect on their patients of digitalis or thyroid extract, and yet how often we still witness the spectacle of the nurses watching the mental patient trying to complete a given piece of work without knowing whether that patient is deriving harm or good from the task. Probably not more than 10 per cent of our patients get either of the drugs mentioned, while certainly over 50 per cent are in need of occupational therapy.

Dr. Salmon has pointed out² that the patients suffering from war psychoses and neuroses must be reeducated in will, thought, feeling, and function. He has said:

It must be remembered that "shell shock" cases suffer from a disorder of will as well as function, and it is impossible to effect a cure if attention is directed to one at the expense of the other. As Dr. H. Crichton Miller has put it, "Shell shock produces a condition which is essentially childish and infantile in its nature. Rest in bed and simple encouragement is not enough to educate a child. Progressive daily achievement is the only way manhood and self-respect can be regained."

The majority of the bed patients, while not having any diagnosed psychoses or neuroses,³ do possess in limited and varying degrees abnormal mental outlooks, which are the natural result of the experience of war and disability. It has been said that no man returns from active service mentally normal, and the variations in his psychological abnormalities are as many and complex as his physical disabilities. Dr. Salmon has suggested the need for reeducation in will, thought, function, and feeling. The emphasis should lie on the reeducation of the will, for the vast majority of the men return after

¹ See Psychological Function, Part II, pp. 35-37, Bulletin No. 6, "Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors," published by the Federal Board for Vocational Education.

² The care and treatment of mental diseases and war neuroses in the British Army.

³ See Occupational Therapy and the War Invalid, Mental and Nervous Disorders, pp. 42-46, in Bulletin No. 6, "Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors," published by the Federal Board for Vocational Education.

the strain and suffering they have undergone with weakened will power. The return of will power, the will to try and the will to accomplish, is dependent on initiative and application.

Initiative and application are two qualities so frequently lacking in the returned man that their absence has given his mental picture that peculiar condition termed the "psychology of the returned man." Army life with its discipline and obedience to orders, tends to destroy individual thinking and initiative, while the variety of activity and the excitement with out-of-door life prevent concentration and continued application.

It is in the development of initiative and application that ward occupations have their special functions. The ward occupational therapist must interest the patient, encourage him to express his ideas, develop these, and see that they are carried to fruition by completion of the task conceived. It is a fundamental principle in developing mental power, and especially when mental training is given through manual work, that conception and execution keep pace with each other. Productive thinking means the balance of these two. The poorly paid man at the bottom round of the labor ladder is the one who has physical strength, but not the mentality to conceive or to carry out instructions without direction. The brain that can conceive but has not the stamina to apply itself is the scattered mind frequently typified in exaggerated states in neurotic and psychopathic persons. Ward occupations then must at first be so simple that little conscious initiative or application is demanded, but the completion of each task must mark a degree of progress in each. As Dr. Salmon has said, "Progress through achievements constantly more difficult is the keynote of reeducation in the war neuroses." The mechanism of recovery by occupational therapy is simple. It is the stimulus of an idea, the directing of that idea, so that doubt, fear, indecision, or indifference do not prevent its logical execution, and the development through progressive steps of orderly industrious habits of thought with the accompanying initiative, application, and will power.

Dean Cullimore says of his experience in the curative workshops at the Walter Reed Hospital:

I feel that the bedside work in its occupational phase is of the greatest possible value. The problem, after all, partakes somewhat of the nature of all our high types of education. Our object is to create initiative, to make a man want to do, to furnish a compelling interest which will force the man to learn. All our friends in Canada agree that the creation of this initiative is the one outstanding educational problem having to do with the reestablishment of the soldier. All agree that this must be done early, before hospitalization sets in. It can be, and it should be done; it can be done best at the bedside.

It would seem that the quickest and most efficient way to develop this quality is to give a man some definite result to obtain or job to perform; to place the

entire responsibility for its satisfactory completion upon him, and to leave the details to his own initiative. At first the task must be easy and the result very definite. The result must be, further, concrete and recognizable as a good result, as a finished piece of work. Moreover, the time of accomplishment must at first be short—at the very first not exceeding the period assigned for the work in hand. In other words, the man at first must complete at one sitting a definite thing. Remember that these men with their depressing experience are much like children and the initiative which they have must be ushered back slowly. In common with children, they lay down work, never to pick it up again, the interest having gone. It will, of course, be very necessary in the actual administration of this work to so grade the successive exercises that the men will be continually stimulated and at the same time led into more protracted periods of concentration.

PHYSIOLOGICAL VALUES.

As the men are confined to their beds, many of them in restricted positions or in wheel chairs or unable to leave their wards, if up, it is apparent that during the period of ward occupations little functional rehabilitation can be accomplished beyond the limits of scientific exercise of fingers, wrists, elbows, and arms, with possibly some shoulder movements. In order that these may be systematically exercised before an ankylosis has become set, it is desirable that functional rehabilitation begin as soon as the doctor permits movement.

The occupations given for functional restoration at this period are necessarily those which involve movement of the arms and are possible to give at the bedside or in the ward. It must be remembered that no occupation is therapeutic in itself, and that it becomes so only as it is selected and taught in relation to a particular disability. Some of the mental processes possible to develop through basket making have already been described. The illustration of basketry may be continued, with its possibilities as an agent for functional restoration. The size, shape, and weight of the basket determine whether the movements involve wrists, elbows, or shoulders. Large reeds and simple weaving require strength and *broad* movements rather than skill and coordination. Raffia and an intricate pattern or stitch involve delicacy and accuracy. Fingers which can not close about a reed of ordinary diameter can firmly grasp one of large diameter. As the fingers are thus unconsciously exercised the range of movement increases, and the fingers may progressively hold reeds of smaller diameter. Rope or twine in place of reeds will sometimes relieve muscular tension and give pliability to the fingers.

When functional reeducation is to be given, a scientific measurement of the patient's limitation of movement is necessary, and his progress should be charted. In order to do this it will be necessary to have some way of picturing range of movement. Some such charts as figures 1-5 are suggested. These charts are used by the

board of pension commissioners of Canada and were prepared by the Canadian Army medical corps. Charts used for functional re-education would indicate the patient's exact disability, and not only

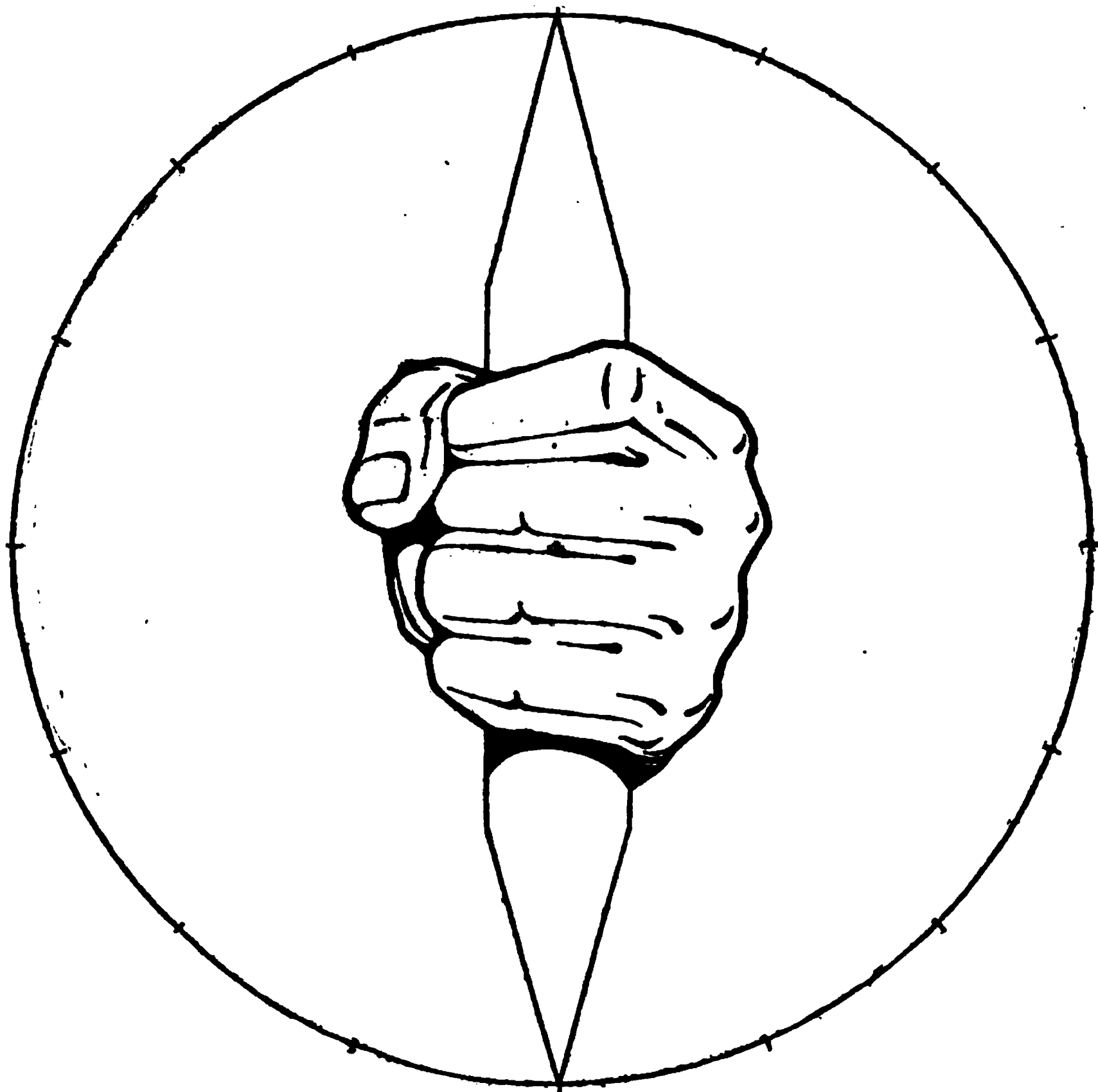


FIG. 1.—Supination and pronation of the forearm (left).

The arm should be held in position of forward elevation from the shoulder. A pencil, or similar object, to serve as an indicator, should be grasped in the closed fist so that its point will move in an arc when the forearm is rotated. Measures should be taken to prevent participation of any shoulder movement. In certain cases where shoulder movement may be a factor of importance in increasing the range of movement, use one diagram to show movement in forearm solely and another in which shoulder movement is permitted, stating what each diagram is to show.

Mark with ink on the circumference of the circle in the diagram, the points indicating the position of the upper end of the pointer in extreme pronation and extreme supination (active). Join these points with an ink line following the circumference of the circle, which will then indicate the full extent of active movement.

If it is considered desirable to indicate passive movement also, use another diagram in the same way, stating that it shows passive movement.

Each subdivision of the circle represents $22\frac{1}{2}^{\circ}$, or one-fourth of a right angle.

guide the instructor in directing the occupations designed to exercise disabled parts, but also provide a method of registering results.

Such devices as those used for exercising fingers and arms at Hart House, Toronto, Canada, may be brought to the bed or wa-

and systematic exercise begun. These may be supplemented and in some cases replaced by occupations involving finger and arm movements. Typewriting, with light or heavy touch, as the case may require, weaving, metal craft, modeling, and basketry suggest some of the varieties of manual possibilities.

When occupation is given for functional purposes, unless there be mental complications, the instructor must give that occupation which calls into play the particular muscles or joints needing exercise.

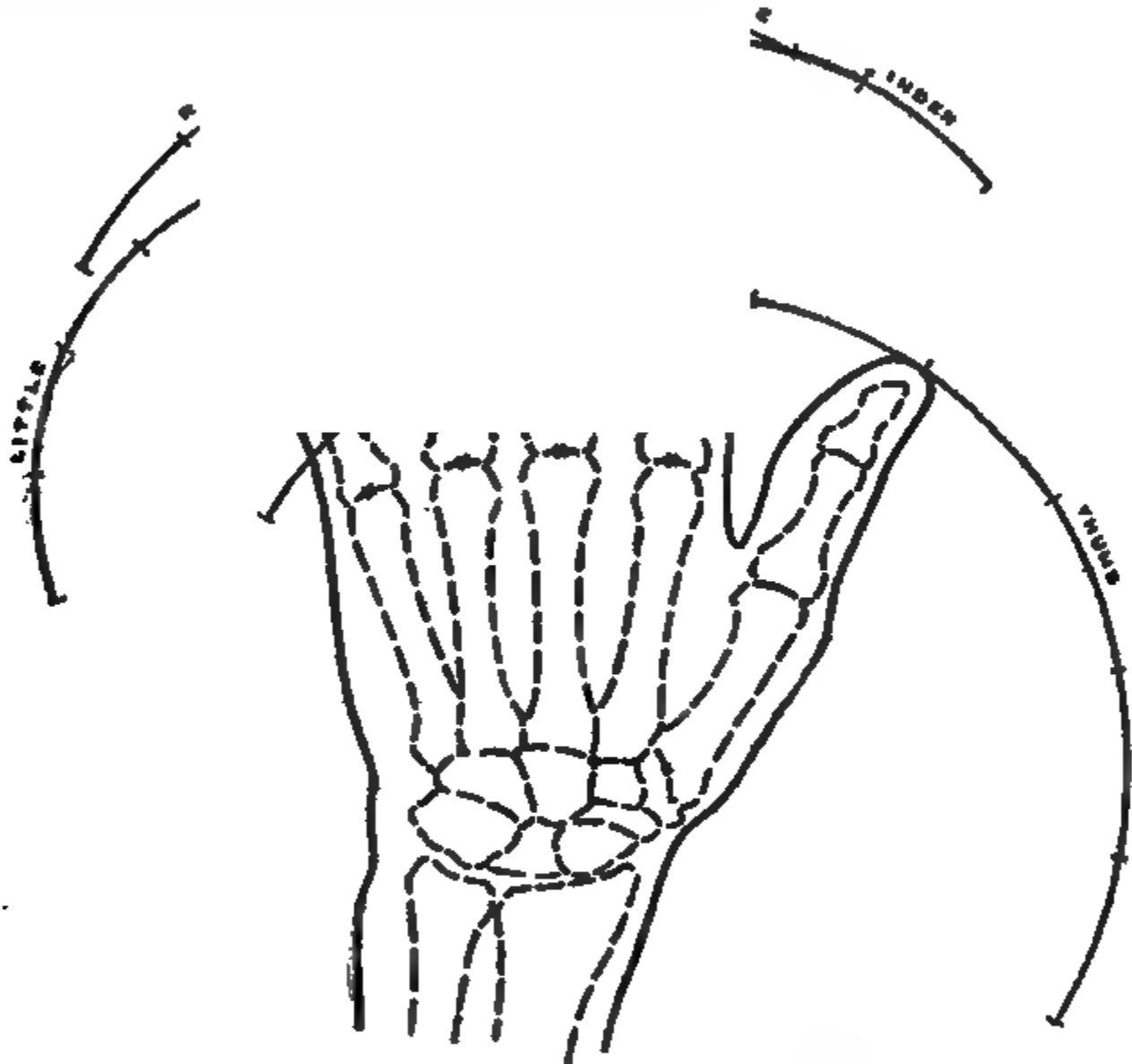


FIG. 2.—Abduction and adduction of fingers and thumb (left).

In each case mark with ink on the circumference of the particular arc in the diagram the point of extreme abduction (active) and extreme adduction (active). Join these points with an ink line following the circumference of the arc, which will then indicate the full extent of active movement.

If it is considered desirable to indicate passive movement also, use another diagram in the same way, stating that it shows passive movement.

Each subdivision of the arc represents $22\frac{1}{2}^{\circ}$, or one-fourth of a right angle.

This will frequently result in poor work, as limitation of movement, lack of coordination, and nicety of direction do not produce accuracy or fine work. To put such patients at work which they can do well and which does not exercise the disabled parts would be to disregard the entire therapeutic aspect of the work. Functional re-education is necessary in both neurotic and orthopedic cases. In the

neurotic cases, where the form taken is that of an inhibited movement, movement can be brought back by exercise and use. In orthopedic cases the limitation is sometimes functional, sometimes permanent. In the functional case reeducation is possible, as in the neurotic cases, but in permanent disability occupation must be given in spite of the handicaps, and accommodation acquired. Those having distinctly functional difficulties may use occupation from a therapeutic standpoint to exercise definite parts, whereas the permanently disabled must use it as practice time to develop latent skill and adaptation.

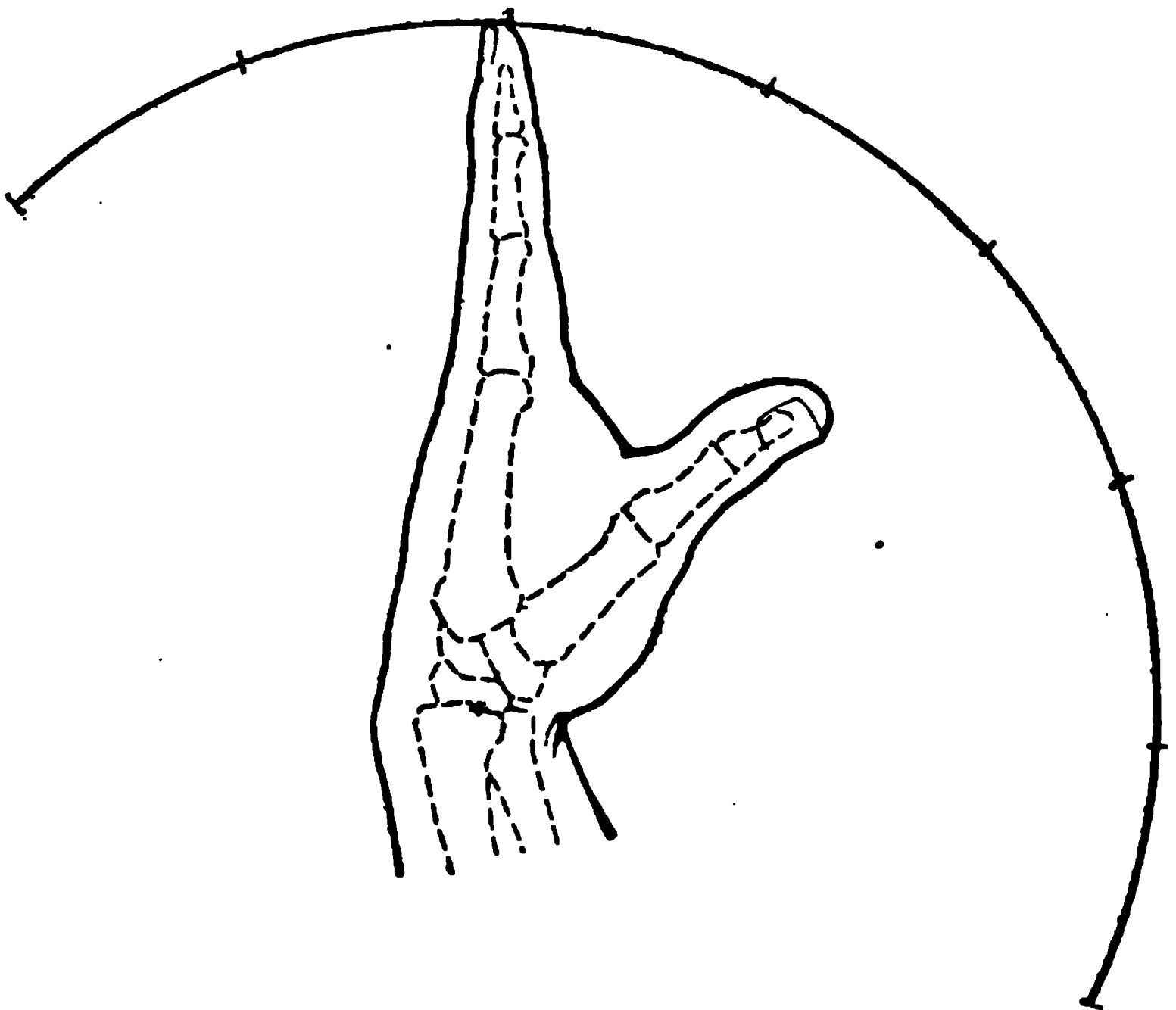


FIG. 3.—Flexion and extension of the wrist joint (left).

Mark with ink on the circumference of the circle in the diagram the point of extreme extension (active) or hyperextension (active), if such movement is possible, and of extreme flexion (active). Join these points with an ink line following the circumference of the circle, which will then indicate the full extent of active movement.

If it is considered desirable to indicate passive movement also, use another diagram in the same way, stating that it shows passive movement.

Each subdivision of the circle represents $22\frac{1}{2}^{\circ}$, or one-fourth of a right angle.

Ward occupations in all these cases must be considered not as ends in themselves, but as first steps in complete rehabilitation. An occupation which improves functional use at the early period of ward occupation marks a first and important stage. Dr. Salmon has said:¹

Basket making and net making are good bed occupations for cases with extensive paralyses, as are making surgical dressings and various minor finishing operations (sandpapering, polishing, etc.) on

¹ The Care and Treatment of Mental Diseases and War Neuroses in the British Army.

products of the shops. All occupations, and especially those which are carried on by patients seriously incapacitated, should be regarded as only steps in a process of progressive education. Every effort must be made to prevent skill acquired in them from being considered as a substitute for full functional activity. Herein is an important difference between the "reeducation" of neurotic and orthopedic cases. In the latter the purpose is often to make the remaining sound limb take on the functions of one which is missing or permanently disabled. *The function held in abeyance through neurotic symptoms must never be looked upon as lost.* It can and must be restored; and if another function is developed as its surrogate, the



FIG. 4.—Lateral movements of hand (left).

Mark with ink on the circumference of the arc in the diagram the points of extreme lateral movement (active) and join with an ink line following the circumference of the arc, which will then indicate the full extent of active movement.

If it is considered desirable to indicate passive movement also, use another diagram in the same way, stating that it shows passive movement.

Each subdivision of the arc represents $22\frac{1}{2}^{\circ}$, or one-fourth of a right angle.

day of full recovery is thereby postponed. Bed occupations, therefore, must always be regarded as the first steps in a series which is to culminate in full activity.

The physiological values of ward occupations are not confined to the functionally or permanently disabled. The exercise, interest, stimulus, and contentment which they create have a reaction upon the entire system and do in most cases assist in general improvement.¹

UNDERLYING THEORIES OF OCCUPATIONAL THERAPY.

There are two theories upon which occupation from a therapeutic standpoint has been based in the past. The first is the attitude of

¹ See p. 37, Physiological Functions, Bulletin No. 6, Federal Board of Vocational Education.

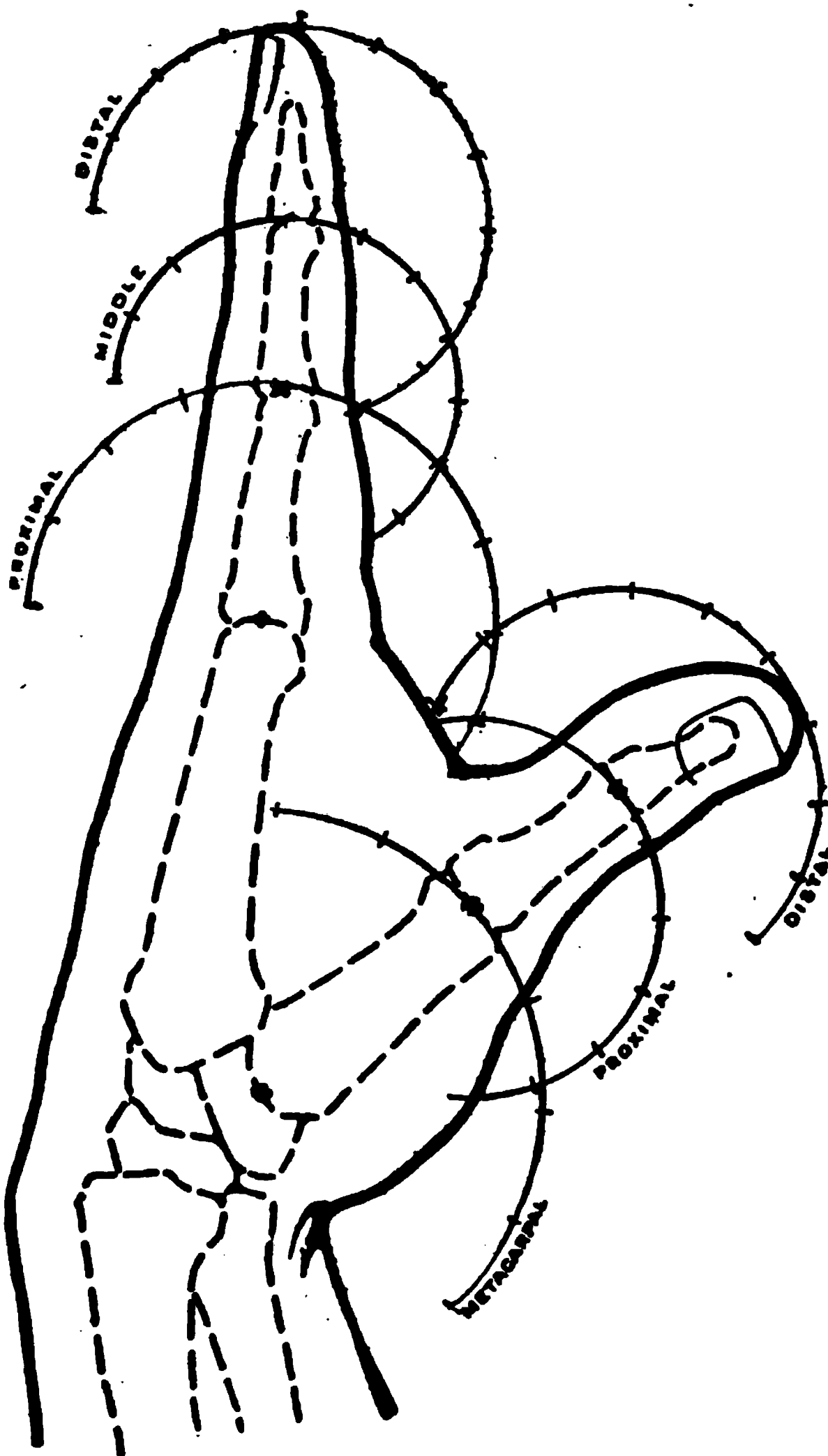


FIG. 5.—Flexion and extension of fingers and thumb (left).

In each case mark with ink on the circumference of the arc in the diagram the point of extreme extension (active) or hyperextension (active), if such movement be possible, and extreme flexion (active). Join these points with an ink line following the circumference of the arc, which will then indicate the full extent of active movement.

The finger in diagram may represent any finger. Use as many diagrams as there are fingers affected, distinguishing by "index," "middle," "ring," and "little." Do not refer to fingers by ordinals.

If it is considered desirable to indicate passive movement also, use another diagram in the same way, stating that it shows passive movement.

Each subdivision of the arc represents $22\frac{1}{2}^{\circ}$, or one-fourth of a right angle.

many occupational therapists, namely, that the concrete value of occupation is its power to turn the patient's attention away from his disability, this in itself frequently constituting a real cure. This group of therapists makes occupation interesting, makes it approach normal activities, and makes the patient as little conscious of any abnormality as possible. There is, on the contrary, another smaller group of occupational therapists who believe the patient's disability should be uppermost in his mind. They relate the occupation so closely to his disability that he is keenly conscious that occupation, as an interest or diversion, is not the primary concern, but as a part of his cure it is fundamental. He is taught to be faithful in that occupation as he would be in taking a drug, and he develops a genuine interest in measuring his improvement by increased ability and length of periods of work.

There is something of the sportsman in every human being brought out either by competition with others or by overlapping his own record. Competition between handicapped patients has grave dangers. Games and remuneration of the men may provide a stimulus, but the greatest care must be exercised that an unfair competition between men of unequal handicaps does not result in hardship and discouragement far outweighing any good results. When a patient is absorbed in beating his own record he secures all the benefits of competition with none of its dangers.

Advocates of both systems are alike enthusiastic over their results. While these two methods seem diametrically opposed to each other, an analysis shows that they are not irreconcilable, but that the psychology of both is sound and both points of view are needed in directing ward occupations. Temperament, intelligence, mental and physical disability, and the relation of the ward occupation to the patient's future must determine whether he can be approached immediately on the ground of his interest and economic future, disregarding any present disability, or whether there must be a previous stage when occupation must be closely related to disability and be a means to an end rather than an end itself.

The first theory is especially applicable in the majority of mental disorders, though by no means in all cases. As a rule, the chief aim is to direct attention away from the disability into healthy channels of interest and effort. This is especially necessary for patients inclined to self-analysis and morbid introspection. In the case of some physical diseases, Dr. Stedman¹ speaks of the harm of centering attention upon disability. He refers to Yarotzky as emphasizing—that the physician with his examinations and directions focuses the patient's attention on some organ and thus, by suggestion plus autosuggestion, may induce exacerbation of existing derangement.

¹ Recent Progress in Psychiatry: The Boston Medical and Surgical Journal, May 9, 1918.

There will be many cases, the majority perhaps, which should never have any other point of view than that of the interest and diversion found in doing the task which is bringing about the deeper therapeutic values and the task that is developing new powers of concentration and application. This method is particularly desirable in looking ahead from ward occupations to the further steps in re-education, for it is apparent that the sooner the men forget their disability, and the sooner they think of themselves as normal men capable of earning a regular wage and doing a man's work, the better. This point of view must then be the goal, the disregard of disability in the interest and production of work. If this point can be reached during the period of ward occupations, the sooner is the patient on his way to industrial rehabilitation.

There will, however, be a limited group of patients who will find no interest in any of the ward occupations possible for them, however wide and varied their range. There will seemingly be no approach to these patients except the one of their disability which is uppermost in their minds. This then is the point of contact, and an interest which first centers about the disability and suggests occupation only in relation to it may lead eventually to interest in occupation for itself. The largest group which may respond best to this theory of approach will be those needing functional rehabilitation.

The doctor's prescription is of great value to the patients treated by the second method of presenting ward occupations. Mr. Norman L. Burnette, formerly director of occupations at the Whitby Convalescent Hospital, Canada, lays great stress on the psychological effect of the prescription slip. The patient who sees in this work prescription the result of as careful attention on the part of the doctor as he would give to a drug prescription is more inclined to take his occupation seriously and profit by it.

The work prescription, on the other hand, is as psychologically bad for the patients who need to get away from all suggestion of disability as it is desirable for those who need to have their attention called to it. In many circumstances patients have resented work made a routine of hospital life and have taken it in the lifeless sort of way that they take other treatment or drugs, thereby destroying its chief benefit. For these patients it is desirable for the doctor to issue a permit card giving them the privilege of occupation. The psychology of the word "permit" has been found to have a marked effect. Patients were eager for that which was permitted, not ordered. They measured improvement by the permissions on their cards. They talked of what they would do when this and that was allowed, and a spontaneous interest and enthusiasm for work was created without which therapeutic results would have been almost impossible.

Whether the patient is conscious of work being definitely prescribed to aid his condition or whether he is thinking of occupation as a privilege not interfering with his recovery, the determining of occupation must always be a matter of serious consultation between the doctor responsible for the patient and the ward occupational therapist. Whether the patient knows there is a prescription or not is a matter of psychology; but it is always necessary that there be a prescription, and the results of occupational treatment should be charted.

It is evident, therefore, that both theories of presenting occupational therapy have their places, and the doctor's prescription may be shown to the patient when desired. It is for the trained instructor in consultation with the doctor to determine which method of approach is best in each case. If the theory of focusing the patient's attention upon his disability is used at the beginning of occupational treatment, the instructor must know how to make it unconsciously lead into the other theory, in order to make him interested in work for its own sake and its relation to his future economic independence.

ECONOMIC VALUES OF WARD OCCUPATIONS.

BACKGROUND AND OCCUPATIONAL NEEDS OF THE MEN.

The occupations which may be desirable for ward occupations can only be determined after a careful analysis of the patients themselves, of their disabilities, interests, education, and experience.

The patients in a ward will suffer from many different disabilities. Although the tubercular, the shell shock, the orthopedic cases and others will be grouped together, within any grouping there will be wide range of physical and mental complications. These patients will moreover be in every stage of cure varying from those who can only listen to stories or look at pictures, or manipulate nothing heavier than a needle, to those whose minds are active and who have full use of their arms in bed. There will also be those who are able to move about in the ward, and who have recovered to such a degree that it is essential that definite and conscious mental and physical demands be made of them for their future welfare.

The separation of officers from enlisted men does not in any way insure a common interest in either group. Among the officers there will be college bred men, men of high professional ability, together with privates risen from the ranks, while among the enlisted men there will be those of superior education and social experience, as well as the rank and file of drafted men. These men will vary in their interests from those with crude tastes and a material outlook for creature comforts to those with the finest idealism and desire for culture, art, and literature. Some will have decided bents and others

no particular interests. Some men of domestic interests will be eager to return to their homes, and will think and plan to that end, while others will be unsettled and restless, with no definite idea of where they are going or what they will want to do.

In education these men will range from illiterates and those who dropped out of school at every grade in the grammar and high school to the postgraduate and professionally trained man. Among the poorly educated there will be men of keen intelligence who never had the chance to go to school, but who have acquired a fund of practical knowledge; and among those with better educational opportunities will be some men who have never made good.

The miscellaneous group of men who find themselves in a ward will represent a wide range of activities before service in agricultural and in professional and industrial lines. They will include men who were engaged in all kinds of construction work, from the architect, draftsman, engineer, and foreman to the day laborer. They will vary from the most unskilled labor to men of inventive genius and technicians of the highest order. Some will be specialists, never having learned but one process of machine operating, while others will be versatile, semiskilled, having been seasonal laborers who had shifted employment with every change in the labor market. There will be those who had been foremen with executive ability and those who were only capable of carrying out simple instructions under supervision.

The problem of relating ward occupations to later periods of re-education for such a group, having no common denominator in either background or future goal, is indeed complicated.

It can best be approached by analyzing the proportion of patients to be reeducated, by determining the scope of ward occupations, and by classifying the patients according to their occupational needs.

Canadian figures, which are approximately substantiated by those of other countries, show that 80 per cent of the disabled in the hospitals are able to return to their former occupations, and that of the remaining 20 per cent, 10 per cent need complete vocational reeducation and 10 per cent partial vocational training. These figures are significant in their bearing upon ward occupations. It is evident that some of the reasons for selecting ward occupations that are vocational or prevocational do not apply in the case of patients who require no reeducational training. Although these patients need no training to become employable, their need of occupation must not be minimized from the standpoint of morale, therapeutic requirements, and cultivation of habits of work. Such patients constitute the largest group in numbers, being four-fifths of all. The influence and effect of ward occupations is particularly important for them. The

patients taking training will be able to adjust themselves to civilian life in the school or supervised shop. But for those who will have no such training the only opportunity for adjustment to work will be in hospital occupations. Thus, begun in the ward occupations and completed in the curative workshop, there must be some preparation for the demands of civilian employment. Regularity and habits of work must be learned, military customs broken down, and self-discipline and ambition reestablished.

Ward occupations, even though they may have no vocational bearing for these patients, must nevertheless be as practical as is consistent with medical requirements. A number of possibilities present themselves.

The self-improvement classes, as they are termed in Canada, are the solution for a large number of patients. Whether the patient be illiterate and so need to learn to read or write or has gone through the whole or only a part of grammar school, the period of ward occupations will alike furnish a time for improving educational equipment. It will be a time which the professional man or student may cherish to continue studies or develop neglected lines. Because a man needs no training to continue his former occupation, it does not follow that he can not improve his proficiency in that line. Such helpful subjects as a theoretical knowledge of the practical work he knows—English, mathematics, and commercial geography—will add to his industrial efficiency. The value of education, “the workingman’s capital,” can not be too strongly urged, and a liberal education is an asset in vocational equipment. The field, however, is wider than academic subjects. A knowledge of bookkeeping, salesmanship, farm or shop economics, and theory of buying and selling, although the training is not pursued for vocational ends, may have an indirect vocational value.

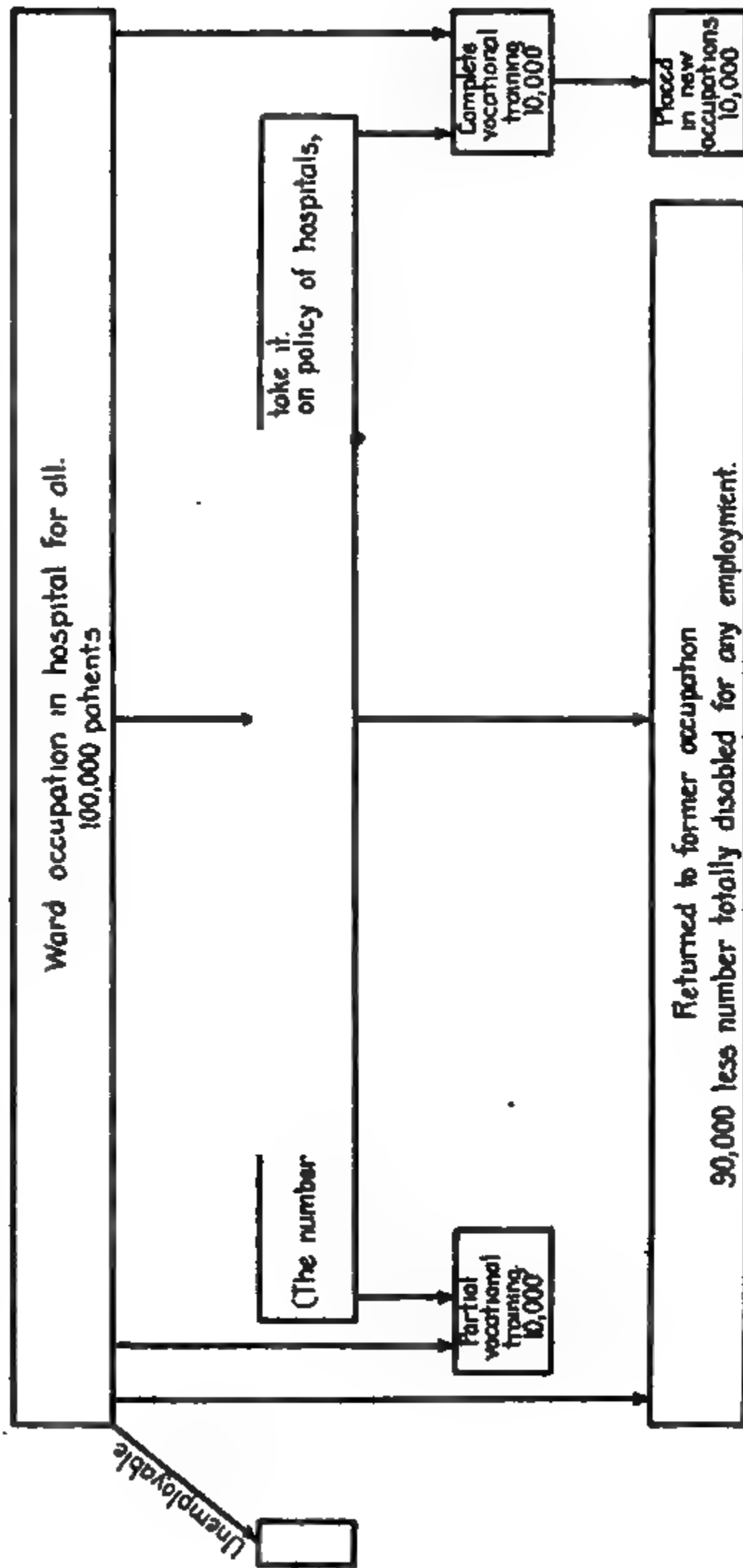
The patients who can not be reached through their minds, but who can use their hands, have a wide variety of occupations, among which are typewriting, free-hand lettering, designing, mechanical drawing, and blue-print reading.

Subjects which are less closely related to wage-earning occupations are worth while, as they increase social interests and resources. Crafts hold a large variety of these interests, as well as therapeutic possibilities, especially the more useful ones, such as metal and wood-working, textile weaving, and bookbinding.

Ward occupations should have prevocational value, whenever possible, for that 20 per cent of the patients who will need partial or complete reeducation. Crafts are less desirable for these patients, as they do not need resources so much as new channels of economic activity. Educational improvement and such elementary processes of the new vocation as is possible to perform in the ward should be selected for this group of patients. The nature of the patients’

CHART

Illustrating return to civil employment of 100,000 disabled men.
 Areas are proportionate to numbers which are necessarily only approximate.



disabilities and the equipment limitations of the ward will preclude many desirable processes, but training of a sound character may nevertheless be begun.

OCCUPATIONAL FINDING.

The great value of ward occupations from the educational standpoint is not so much the results achieved by vocational and prevocational training as it is the opportunity furnished for vocational finding. There are instances in all the countries of rare talent, genius, and bent being uncovered by ward occupations. This is not strange when it is known that the majority of men enter upon life occupations in a most haphazard way, and that few have had the opportunity either in their limited schooling or in their industrial experience of discovering their natural interests and aptitudes. Furthermore, the limited data which the vocational officer can secure during the preliminary interview on which to base a vocational scheme and the doctor's uncertain prognosis for the patient at this time, prevent a scientific and completely outlined course of vocational training. Ward occupations give an opportunity for occupational finding. They present many lines, and, as the patient tries them out and reacts, he may in a large measure determine his future. By the time the doctor is able to make a definite statement regarding his future physical condition, and the vocational officer able to secure detailed information to establish a proper training course, the patient will have found his own interests, and under careful guidance have formed his own desire and choice for training. Thus, as the curative workshop experience is in many cases vocational finding for the vocational school, so ward occupation is occupational finding for the curative workshops, and more remotely for the vocational school itself.

NEED OF WIDE RANGE OF ACTIVITY.

From the heterogeneous nature of a group of patients within the ward it is evident that many occupations are necessary, not only to catch the interest of men with diverse tastes and backgrounds, and to further the treatments of a large and complicated number of disabilities, but to offer a wide range of choice for occupational finding.

So complicated is the problem of ward occupation and so many and so apparently conflicting its purposes that it would be difficult to solve and difficult to organize a ward or prepare a teaching staff were it not possible to classify ward occupations into the following four relatively simple groups in which patients may be given work according to their individual occupational needs:

- I. Entertainment and recreation.
- II. Self-improvement study.
- III. Craft work.
- IV. Practical work.

CLASSIFICATION OF WARD ACTIVITIES.

ENTERTAINMENT AND RECREATION.

There will be patients too ill for regular occupation, whose minds are not yet ready to be focused or who must lie in such restricted positions that use of hands or eyes is impossible. Time will hang heavy for these patients. Stories and pictures, simple games, and puzzles are the only possible occupation. The stories, the pictures, even the games and puzzles, must be carefully chosen by the director of occupations. Some patients will want stories unrelated to the war and their sufferings; others will be more interested in current events. Stories of the industrial and agricultural needs of the country, both for war and reconstruction, are dramatic. These will keep the patients in touch with the world and little by little arouse in them the desire to serve their country in this new way. When later a patient may express a wish to be an oxy-acetylene welder the seed will be found to have been sown way back in ward occupations when the instructor told him the story of oxy-acetylene welding, its discovery, and its use in war and industry. Biographies and the stories of men who have succeeded by spirit and courage inspire optimism.

Too great emphasis can not be placed upon the recreational and entertainment phases of ward occupations. Ward occupations are intended to normalize the patient, and the nearer he can come to his regular habits of life the better. Recreation should have a part in these.

Dean Cullimore suggests entertainment, occupation, and education as three phases of ward occupation that "should be definitely recognized and coordinated in such a way that each may help and supplement the other." A patient's occupational needs are not limited to one of the groups. He may be benefited by all; recreation, study, and manual work. There is a strong reason for linking play and work. One balances the other, giving variety and impetus, and insuring the fullest benefits from each. Recreation and play are particularly necessary for those confined to beds or wards, as the day at best is monotonous, and interest and variety are at a premium.

There should be trained aides responsible for the recreation and spirit of the ward. This is too important a detail to be left, as has been the case in some instances, to well-intentioned but untrained women visitors. Such workers have caused real harm. The most beneficial kind of entertainment is that initiated and carried out by the patients themselves, where supervision has been careful but not apparent. There is nothing which produces a better effect on the men than interest and contentment, and the play spirit is the channel through which these are born. Recreation of the right sort can

be a real stimulus without sacrificing any of its entertaining features.

Simple and trivial occupations are necessary in some cases, recreation in all. These have their place and are valuable so long as they are directed by one skilled in this line. They become pernicious when play which can be directed into better ways becomes wasteful of time and effort. Play must be balanced in every possible way by some form of work, and so be recreational in its truest sense.

There is no limit to the possibilities for recreation in games, stories, puzzles, pictures, and music.

SELF-IMPROVEMENT STUDY.

No sharp line of distinction can be drawn between recreations and study. The ability which the teacher must possess to make play interesting and entertaining for the sick must enable her to make play out of study. For instance, foreigners must be taught English not by grammar but by means of a vocabulary learned in simple, entertaining stories and conversation. The pupils should be encouraged to talk and gain confidence by telling stories of incidents in the old country which they recall or experienced in the war. Penmanship has an interest when letters are written home or to comrades and friends. Stories and events of interest quicken a desire for reading and when carefully selected may open a world of suggested thinking.

Scarcely a patient will want to learn spelling from a book or even a teacher, but spelling as taught by introducing the "at" family and letting the patients find the relatives, "bat," "cat," "that," etc., down the line produces keen rivalry in finding the greatest number of words ending in "at."¹ A game may be played to find the largest number of different words which can be made out of the letters of a word such as "Mesopotamia." Anagrams may follow, and the patients will have developed an interest in letters and words that make possible real spelling lessons. Maps cut up into puzzles, geography games, stories of foreign peoples, places, and pictures lead to the study of geography, while mathematics furnishes an endless number of games, problems, and puzzles.

The ordinary normal-school methods and practice of drilling will prove unsuited to the training of convalescent men. Interest and play and the ability to find these in study should be the first consideration of the teacher. Following this there may be study of a more systematic kind; but instead of being an end in itself or a preparation for a higher grade, it must at once be linked up with the patient's wage-earning occupation. He must be able to see its practical application to his particular job; thus the boiler maker

¹ Method used by Dean Cullimore.

may learn the principles of arithmetic in laying out boiler plates, while the carpenter may learn the same in terms of laying out lumber, and a future grocery salesman through weights and measures. The application of principles learned in some of the technical lines of military life to industrial processes will be of keen interest to a large group of patients.

Study is an interest or recreation in itself to those patients who have already been well educated, and the guiding of them is relatively simple.

The subjects possible in the self-improvement classes range from reading and writing for illiterates, through high-school studies to college work. They include the field of related subjects in vocational education, such as shop arithmetic, commercial geography, and semitechnical reading.

CRAFT WORK.

Crafts and work with the hands have a natural appeal. The men whittle in the trenches, engrave shells and make aluminum rings, and various articles out of the bits of wood and metal they find about them. The crafts have so many possibilities that they must be considered in a class by themselves. The fact must not be lost sight of that they have recreational, educational, and practical features. They may be chiefly occupational, in the sense that they balance the time between recreation and work or study in that part of the day not given to treatment or rest. Crafts have been suggested as resources for men not needing practical work or study. They may also be resources and recreation for the men who do need practical training. As shorter hours of work and labor-saving devices are increasing the hours of leisure, a problem of no small concern is the proper direction of that leisure. Automatic machinery and specialized processes demand little inventive genius or creative ability. The rounded life of the workman demands self-expression. He needs it to enjoy his leisure, and his employer will find him the better workman for hand and mind training. This has been stated in a report of the Second Annual Meeting of the Inter-Allied Conference held in London on May 20-25, 1918.

The reeducation of the disabled, the revival of agriculture, of industry, higher education, and the raising of the standard of life all depend on the right use of the handicrafts and on the full use of the energies of our craftsmen at the present juncture. *The basis of training*, of healthy agriculture, prosperous industry, and commerce is provided by the handicrafts.

The report continues to say that education, creative activity, and national life may be knit together, and that all forms of craft activity are essential to the full life of any nation.

They are invaluable as training and preparation for any form of industry, and even if the whole world is given over to automatic machinery, the crafts

will be needed as a field for experiment, a relief from monotony and as an enrichment of life.

As the democratic trend of the time has made possible vocational education, so it has democratized art and created the new term of "industrial arts." William Morris said early in the democratic movement: "I do not want art for a few, any more than education for a few, or freedom for a few." Ruskin, before Morris, had pointed out that an art which was evident in national life belonged not to a favored few but to the masses, and that good doors and garret windows are as characteristic of an age of architecture as churches and palaces. Art, if it is to be an integral part of national life, must be experienced by the toilers and exist as a resource and an opportunity for self-expression in the leisure hours of the present highly industrial age. "Life without industry is guilt; industry without art is brutality."¹

The significant feature of the industrial arts is the association of art and labor, and the effort to bring creative ability into the routine of specialized processes. It is the ideal which aspires not only to give dignity and individuality to an age of machinery but also to convert work of hand and brain from work that is sordid and mean to work that is noble and imaginative.

It is in this sense that the industrial arts, with their thought of the workman's full time, have a social significance in the development of the new social order. Ex-President Eliot, of Harvard, has said:

I have lately had occasion to think a good deal about conditions of labor in our American cities, and the saddest thing I have learned is the lack of the happy spirit of labor in American industry. That is the most pathetic and lamentable thing. What is the cure for this prodigious evil? It is the bringing into American industries the method and spirit of the artist.

It may not be possible to bring this spirit into industry itself, but it can be brought into the lives of the workers by education and resources, such as the crafts offer. The more mechanical a man's work, the more necessary it is for him to use his creative faculties in his leisure time. His broader interests, the exercise of a certain inventive genius and stimulation to his mind, make him in the end a better workman, and that which was intended as a resource does in fact have a socializing and educational influence.

The crafts have a definite educational value. Not only do they develop manual dexterity, but they train the mind through the hands. This method has long been recognized as sound educational training. It is supported by modern psychology.

It is realized that a motor education, best obtained through the practice of craftsmanship, is absolutely necessary to the fullest development.²

¹ John Ruskin.

² Peter Sandford, University of Toronto, School and Society, July 20, 1918.

The balance between conception and muscular coordination, which is so important when the crafts are used for therapeutic purposes, has the underlying educational principle that in the adjustment of these two, in mental growth and manual skill, lies the secret of a thorough and practical education.

In England the Arts and Crafts Society has suggested that committees be formed in each training center including in their membership masters, artists, craftsmen, workmen's delegates, and educationalists, to advise on methods of training, with especial reference to handicraft work. Such committees would report to a central organizing committee composed of craftsmen, designers, technical experts, workmen's delegates, and manufacturers, which would be responsible to the Minister of Pensions, the Minister of Labor, and the Minister of Reconstruction.

In the forecast of the reorganization of industry and manufacture after the war it is predicted that articles formerly imported because of a superior art quality will be produced in this country. This will mean a keen competition of quality and design, as well as workmanship, both between nations and between manufacturers within the Nation. It is in preparation for this new industrial era that France, Switzerland, and the central powers are already making use of their artists and craftsmen.

Switzerland, in concert with the alertest brains in France, has within the past few months begun a campaign for the revival of industrial and decorative arts in all her cantons. * * * Industry can not be renewed without a new spirit; as the promoters of reform in France have said, "Henceforth the spirit of artistry must inform all we do."¹

This means not only a new vocational opening for trained designers, but it means the appreciation of design and the craftsman's care in execution.

The craftsman differs from the ordinary workman only by the intensity of his concern for the quality of his work.¹

Vocational training is necessary for the workmen who will enter those trades which will be influenced by the industrial arts movement. The designers must be given thorough training and the workers a simple preliminary training in design. The secret of the beauty, both in design and execution of the ancient and medieval ages, is that each worker was maker as well as designer. A practical knowledge of tools, processes, and possibilities of raw material is a tremendous advantage to the designer, while an appreciation of beauty on the part of the workman enriches execution. This twofold knowledge can be brought about in this time of specialization by that vocational education which gives to the designer a selected training in shop processes at the machines of production, and gives to the work-

¹ Second annual meeting of the Interallied Conference, London, May 20-25, 1918.

man skill and the elementary principles of design. This last training may be given in the schools, closely related as it is to mind and hand training, and learned in the design and crafts of the industrial arts.

The arts and crafts movement as an economic movement has succeeded only moderately, as must any movement which neglects to take into account the industrial tendencies of the time. In a few isolated communities arts and crafts may survive, as have the hand industries in North Carolina and Massachusetts, but the moment these are successful their products will be manufactured on a large scale. Any such plan of commercially occupying the disabled soldiers is economically of very limited possibilities, but it is expedient that the educational value of craft work be used to increase the industrial efficiency of the worker.

This training of educational, and, more particularly, of vocational value, may be given in the hospitals as ward occupation. Not only is actual training in commercial and industrial art possible in the crafts, but in uncovering latent talent such training is a real method of occupational finding. Good teaching is essential in making crafts first, a resource of social value; second, education in the sense of real mind training; and third, a vocation of practical worth. Excellent design and workmanship are fundamental in good teaching. There is perhaps no line of instruction which has been less standardized and in which there has been more haphazard teaching than in the crafts. This is particularly true of the instruction in hospitals where thorough training has not been considered necessary in a teacher employed "just to keep the patients busy."

The contrast in the craft work of ward occupations in various hospitals is very noticeable. In one hospital where good design is evident it may be found that the designs are furnished by the teacher. Thus possibilities for educational and therapeutic training in design are ignored. Such a hospital may show a fine quality of workmanship, but on investigation a teacher may be found to be taking out the patient's work and substituting her own, without thought of the man's psychology or of the effect on his habits of work. The teacher's only purpose in remodeling the article may be to make it marketable. Good quality of work may indicate in some cases that the men are kept at an occupation after they have mastered it, irrespective of its therapeutic and educational value. Expert workmanship is an aim, but every piece should demand the patient's best effort, and uniformly good work or poor work corrected by the instructor indicates lack of progression or failure to make the patient accomplish that which is consistent with his mental and manual capacity, provided the work was properly selected in the first place. The best craft products may be worthless therapeutically, just as the

best therapeutic results may sometimes be obtained when the products are fit only for the wastebasket.

In contrast to the unwise methods of insuring good design and workmanship adopted by some hospitals, other institutions either ~~leave~~ the patients to make their own designs without adequate assistance or provide designs for patients at random. There is no adequate supervision or instruction if the patient "invents" his own design, and little care or trained judgment exercised where designs are selected for him. The design may be the ready-stamped embroidery patterns of some small-town general store, which are carried out indiscriminately in odds and ends of material. When new materials are purchased for a particular piece, they are no more fortunate in selection. Poor workmanship logically follows poor thought or indifference in planning, and the finished article raises the question: Can any good resulting from such work be commensurate with the waste of material and time? The answer is, no. More disastrous, however, than the waste of time and material, more, even, than the lost therapeutic and educational possibilities, is the positive harm that such work produces upon the men themselves. Work requiring no mental effort in planning creates sluggish mental qualities, and poor workmanship sets a low standard which brings with it loss of self-respect, lack of pride and interest in work, and careless habits that may never be outlived.

In other hospitals good design will be apparent in most of the work, as well as thought in planning, care in the selection of material, and a high standard of workmanship in execution. The individuality in the design will show that it is not the work of the teacher, but in many cases the expression of the men themselves, guided under expert instruction. Pride and interest will have made possible splendid results. There will be a variety in technique which proves that work is not done over by the teacher. Articles made by one patient will show a definite line of progression.

The success of ward occupations depends upon the teacher's personality, training, and ability. Cooperation with the medical services, knowledge of arts and crafts, and recognition of educative principles involved in teaching may lift craft occupations out of the class of mere "busy work" into the class of worth-while work of permanent value.

The Bloomingdale Hospital at White Plains, N. Y., has developed a system of bedside occupations for those patients who are unable to go into the shops. The bedside work is found to be an excellent feeder for the shops in creating the patient's early interest in occupation. It is looked upon as a necessary part of the hospital treatment. The fine quality of work at Bloomingdale, Elgin State Hospital, and the Milwaukee County Tuberculosis Sani-

tarium has proved for all time the possibility of sick people's producing work of a high-grade character. To adapt the work to the patient's particular need and then to develop him through progressive steps is the purpose of the occupational work at these hospitals. Bloomingdale Hospital is especially fortunate in having worked out a scheme of cooperation between the medical and occupational departments which is, in fact, more than cooperation. It is a painstaking interest on the part of the medical staff and intelligent supervision of the patients at work.

There is an endless number of crafts that may be taught as ward occupations. Weaving and metal work hold, perhaps, the greatest variety of possibilities in mental training. The different kinds of looms suggest adaptations for special physical disabilities. For instance, there is a loom at which the patient must actually weave in and out. This insures monotony of work in a simple pattern or steady application in counting threads in a complicated one. The actual weaving in either case require finger movements, whereas weaving on a loom with heddles requires an arm movements in shooting the shuttles with the woof through the lifted threads of warp. A pattern which demands little thinking on a four-harness loom may require just that concentration necessary for a depressed case on a two-harness loom. The reed and heddle may be combined on the small looms, making it necessary for the patient to hold the reed up while running in the shuttle. Harnesses may be shifted by a screw, giving the patient a wrist motion. There are other possibilities for the patient who can sit in a chair or stand at the foot-treadle loom. A clever little bed loom devised at the Bloomingdale Hospital has made possible the weaving of neckties. Netting is possible, and a frame supporting a tennis net may be pushed over the foot of the bed, holding the net in front of the patient in bed and supported by the upright posts standing on the floor on each side of the bed. Rake knitting is a monotonous relaxing occupation, requiring the finger motion of lifting the threads over the rake prongs. Chair caning is also a possible bed occupation.

Metal work appeals especially to men. A small bed bench and vise makes work possible even for the one-armed. Sawing, filing, carving, chasing, engraving, and repousse work are possible processes which may be learned in bed. The up-and-down motion of sawing, the play of the arm in filing, and the manipulation of engraving and chasing tools not only make possible certain exercises in functional restoration, but develop skill and technique as well. Soldering must be reserved for the specially equipped room.

Toy making in sawing out the wooden forms gives practice in using tools and calls for ingenuity. Noah's Ark with all the animals may

keep an otherwise indifferent father absorbed in anticipation of the pleasure this gift will bring his children. The following crafts are suggested for ward occupations: Bookbinding (albums, scrap books, etc.), block printing, drawing and painting, hooked rugs, leather tooling, metal work, modeling (for patients able to be out of bed), netting, rake knitting, reed and raffia work, stenciling, string and knot work, toy making, weaving, wood carving.

PRACTICAL WORK.

OBJECTIONS ANSWERED.

It is understood that ward occupations have their place in the hospital for their therapeutic values, psychological and physiological. These are indeed fundamental considerations; but may it not be asked can not time while being occupied and processes while being given for curative effects be directed to some purposeful end?

There are those who believe occupations can not be so directed, and the reasons they have advanced are:

1. The men are there too short a time to make any real progress in work.

2. The short periods prevent scientific development of mental processes through work.

3. The periods of work are so irregular that they preclude consecutive constructive work.

4. The men are in such an abnormal mental and physical condition they are unable to concentrate. Diversion and entertainment are therefore better, and these tend toward relaxation and the recovery of nervous poise.

The first objection may not be accepted until the length of time defined by "short" is explained. The average stay of the patients in the hospitals for the period they are able to have ward occupations is unknown. An average stay would mean nothing could it be determined. The problem is an individual one in every case. It is expedient if only a single patient remained long enough to make two articles that his second should have evolved out of the first.

In reality the majority of the men measure their periods of confinement in the wards by weeks and months. Few patients remain as short a time as a few weeks, and yet experience shows that a week of idleness or of careless unrelated work, with indefinite or desultory methods, may lay the foundation of a habit which months and even years can not overcome. Any time that is long enough to offer the simplest occupation is long enough to make that work definite, progressive, and related to subsequent stages of reeducation.

The shortness of the men's hospital period, suggested in the second objection, may prevent the scientific development of mental processes

possible in long periods of time, but it should not prevent the work from being given in consecutive steps. Whatever the nature of the occupation may be, practical or purely diversional, progress is essential in order to secure the therapeutic values of increasing initiative and concentration. The elementary steps possible in ward occupations should be regarded as important, not in themselves, but as preliminary to a later stage. It is necessary for anyone having to do with any phase of rehabilitation to appreciate that no step in reeducation is complete in itself, but that each is a part of a great whole. Thus the measure of the success of any functional or mental restoration by ward occupation lies not in the completeness of result, but rather in the thoroughness and care with which occupation was begun, so that its progressive features may be successfully carried on and scientifically completed at the end of rehabilitation.

The varying condition of the patient and the irregularity of his work periods are fully understood in the third objection. Treatment will be given from time to time which exhausts his vitality and leaves him depleted and uninterested. For no apparent physical reason he will have ups and downs of health, immediately reflected in his work. If the patient is allowed to work as he pleases, and for as long or short periods as he chooses, and whenever it happens to suit his interest, his work will become a matter of mood. Mood and the state of health are closely related. If, however, the patient is allowed to work only at stated intervals and for definite periods under supervision, work becomes a matter of routine rather than mood. It is psychologically true that if he must lay his work down before he wishes to he will look forward more eagerly to picking it up again. • He will work with keener interest if he knows there is a time limit. Supervision keeps up his interest, prevents fatigue, and conserves energy. Elasticity in schedule is necessary to meet intermittent periods. Medical treatments, hydrotherapy, electrotherapy, massage, and the doctor's changes in the patient's work prescription may some times make regularity impossible. Yet it can be so planned that the work periods will fill in intervals between treatments and rest periods. Care should be taken that the working period does not follow one of exhausting treatment. Yet a semblance of regularity can be maintained though the period be decreased in time and in demands when the patient is feeling unfit. Regularity tends to tide over moods and periods of weakness, and makes possible consecutive and constructive work.

The fourth objection, that the men are too abnormal to concentrate, requires careful consideration. The abnormal mental and physical condition of the patients at this time is beyond question. The psychology of the returned men, in addition to their disabilities,

presents a complicated problem. Diversion and recreation are suggested as fitting; education and practical work are considered beyond the men at this period. Education and practical work are ordinarily conceived to be exacting and fatiguing, and to demand conscious efforts in concentration, whereas diversion and entertainment are pleasant and relaxing and interesting to the patient. As a matter of fact some games or puzzles and so-called diversions require the keenest mental concentration. There are monotonous kinds of work which claim little or none. Spelling, for instance, requires the same mental effort whether it be learned in a spelling game and anagrams or in a book. The difference between entertainment and practical work lies not in difference in degrees of concentration but in the interest of the patients.

If interest is then the criterion for determining the selection of ward occupations the simple ruling out of productive occupations as uninteresting is impossible. No occupation is in itself interesting. Interest lies entirely in the reaction of the person upon the occupation. For instance, golf may be a diversion to the professional man, but not to the caddy. Movies may entertain the audience, but not a cinematograph operator. Mental effort may be as recreational to the laborer as handwork is to the student.

It is this lack of understanding of the part which interest plays in the determination of a ward occupation and the lack of appreciating the relative possibilities for mental development, both in diversions and practical work, that have occasioned the limited view in the selection of ward occupations which exist both in the institutions of foreign countries and in the United States. Quite regardless of the individual patient's interest, taste, social status, past experience, or future possibilities, crafts have been selected as diversional and time-passing. Crafts may be particularly desirable for the patients, as they can easily be brought to the ward, and they contain unexcelled opportunities for therapeutic values when rightly understood and taught, but it is not true that they are in themselves more interesting and less fatiguing than more practical occupations.

Ward occupations are a medical problem to the extent that the patient's abnormal condition necessitates individual selecting and presenting of the occupation in order to secure the desired therapeutic value. But since therapeutic results are not confined to any series of occupations and interest may be in almost any field, trivial or productive, the problem is an educational one to the extent that whatever occupation is selected it must be taught in progressive steps to have the maximum therapeutic effect. The interest shown in a game of anagrams or playing with the pencil to express an idea may develop into the desire to study spelling or mechanical drawing. There

is the opportunity for the teacher of ward occupations to use Tom Sawyer's understanding of the psychology of his companions when he made play instead of work out of the whitewashing of a fence.

There is no point more important in the teaching of the disabled than the ability to arouse and keep interest, to maintain the play spirit, while bodily functions and mental processes are being restored and while regularity and progressive demands are developing habits of work.

VALUE OF PRACTICAL WORK.

Occupations can not be divided into two such groups as practical and useless occupations. An occupation may be said to be practical which in some way trains or prepares the patient for his future vocation or employment. An occupation which is merely time-passing and which contributes no improved knowledge or skill or awakened interest and which possesses no special therapeutic advantages may be said to be trivial and useless. That occupation is most practical which best restores the patient's mental and physical vigor. After this first consideration that occupation is most useful which is most closely related to his economic future. The patient's physical condition alone will determine how close or how indirect must be that relation. Thus, basketry or a craft, seemingly unrelated to oxy-acetylene welding, or a skilled trade, is practical if the patient is thereby better fitted for work. On the other hand, it is merely time-passing if it possesses no particular therapeutic value for his case or if the patient were as capable of holding a lightweight torch as a reed or as able to learn a trade as a craft.

Beyond the possibility of productive occupations being feasible during the period of ward occupations, they have a psychological advantage of no small account not possessed by trivial pastimes. Given two occupations equal in their therapeutic values for a special case, one of which is trivial and merely time killing while the other is useful, that occupation which is productive and which is related to future economic activity will far outweigh the other in benefit to the patient.

The reason for this is apparent. If medical treatment and re-education are provided to make the patient again self-supporting, and he is to be encouraged to this end from the beginning of his hospital experience, the sooner he sees tangible evidence of his returning ability and of really being able to do something which he and his companions recognize as worth while the sooner he will believe independence possible, and thus hasten cure and training to that end. There have been many cases in civilian institutions where the patient's progress has been retarded by his pessimism and refusal to believe that he could ever again succeed in earning a living. The

turning point in the cure of many of these cases has been when they produced something which they could see was of practical use, and which was the concrete evidence of their ability.

Useless "busy work" has sometimes had the exact opposite effect from that for which it was designed. A patient who had been through a serious illness which left him with a permanent handicap had been doing well and was optimistic and cheerful in the ward. One day it was suggested that he learn raffia work. Basketry and raffia represented to him a useless occupation for a man, only fit in his mind for charity or one who could do nothing else. The suggestion of raffia work for himself seemed suddenly to make him aware of his condition and conscious that others considered him worthless. For days he lay with his face to the wall, unable to escape from the depression and desire to die which had seized him. To be sure, this may be an extreme and isolated case, but it does illustrate the psychological reaction which trivial work creates in some cases. Every instructor of occupations in a large hospital has experienced many times the resentment that some of the patients—especially men—have expressed at being put to work at something useless, or "woman's work," as they have scornfully called it. It has been a test of the instructor's ability to make him overcome this feeling in his interest in the work. In some cases it has been necessary to assume an apologetic attitude toward the task, proving to the patient that the instructor considered him worthy of more, but that the prescribed task was a necessary step in order to facilitate his recovery. The tragic uselessness of much of the work patients are given must be guarded against, lest the heart be taken out of them and they feel themselves condemned to little better than charity.

Productive work, quite aside from any other merit it may possess, has a definite psychological and therapeutic advantage. The patient takes a keener interest in something which he and his fellows recognize as useful and a man's job. He takes hold of it with a zest and enthusiasm which greatly enhances its curative effect.

Practical work has another feature of fundamental importance. It is its relation to vocational training and the later stages of rehabilitation. The sooner work of a serious type begins the sooner is the patient's period of training completed. Thus public funds, equipment, and teaching staff are conserved. But the vital feature of relating ward occupations to the patient's economic future is not simply to conserve time and expense, important as these may be; it is to actually link them to later stages, for the entire scheme of rehabilitation hangs upon the spirit and desires of the patient which are molded and created during the critical days of early hospital life. Dexterity, manual skill, elementary and higher education, theo-

retical knowledge of technical subjects, office and farm management, bookkeeping, and typewriting are some of the occupations possible for men convalescing in bed. Such occupations give them the opportunity to improve themselves and link their early thought and activity with their future occupation.

OCCUPATIONS AVAILABLE FOR WARD TEACHING.

The art of teaching practical occupations is much the same as that of teaching elementary self-improvement classes. The approach to the patient must be first through play, and must gradually develop in him an interest in the subject itself. The instruction must be accurate as far as it goes, for it must be real preliminary training and of a sound prevocational type. The man's interest can be sustained only as the work is progressive, and as they feel it is practical and counts toward future vocations.

Drawing is perhaps the most feasible of all ward occupations. It is easily graded. As Mr. G. E. Barton has expressed it, "Its greatest value lies in the ease with which it can be made to dilate and to 'carry in solution' other occupations." It is the universal language of labor. Mechanical drawing is the basis of many vocations in the woodworking, metal, and building trades. At the least, it is useful knowledge. It may be begun in a simple way, as in rough sketching to represent an idea, or free hand lettering, developing into a study of projection, scale and isometric drawing, cabinet projection, and machine-part drawing. Mechanical perspective and architectural drafting can be taught only when the patients are able to sit at a long bench. Mr. Barton says of the various branches of mechanical drawing:

Each of these divisions is capable still of being subdivided, making an almost endless combination of interests and studies of different value, both therapeutically and reeducationally. The very fact of its intricacy and the great number of subdivisions, each involving different mental and physical exertion, instead of complicating the subject for therapeutic needs, makes it especially valuable and easy to handle.¹

An interest in typewriting may have been started by permitting the patient to write letters home or to his comrades, on a machine which has exercised his stiffened fingers. As he recovers sufficiently to concentrate, he may be taught the touch system in the most approved way. Bookkeeping may teach the patient nothing more in the beginning than a convenient way of keeping his personal accounts. Later this instruction may include double entry, closing of profit and loss accounts, and theory of accounting.

The number of practical occupations is limitless. The following may be listed: Assembling electrical equipment from stock parts—

¹ Modern Hospital, June, 1917.

switch block, etc. (screw driver only tool required); bandage winding with machine; box making (paper boxes from stamped sheets); braiding for straw hats; cigarette rolling; coloring and binding lantern slides; free hand lettering; jewelry making¹; knitting of socks on machine; making of games—boards with paper backs, etc.; making of paper blank books; mechanical drawing; picking over beans; planning garden plot layouts; simple blank book making (collecting sheets, making up cover, pasting, and tying with cord); sharpening small things, such as lancets, knives, scissors, etc., which may be honed on hand hone without grinding; shelling nuts; telegraphy—radio buzzer—bedside omnigraph; toy making (cutting out lithographed forms and assembling stock parts); finishing small parts of work from shops.

LIMITATIONS AND DANGERS OF WARD OCCUPATIONS.

There is the danger in nonproductive work of hurting the sensitive, of crushing that spirit of manly pride which must later be the inspiration to "carry on," and of creating false standards and ambitions. Dr. Bourillon has said in pointing out the mistake made by those in France who were desirous of occupying the convalescing patients:

They have taken games, they have initiated the invalid into the making of small articles. These pastimes, while seemingly healthy and beneficial, have had grievous results. * * * Their small labors, which might be such a pleasant way of preparing the mutilated for more serious occupations, have on the contrary often been the means of turning them aside from their pursuit of a real vocation. * * * What was intended as an encouragement toward training has become a premium on idleness.

Dean Cullimore says:

I am not in favor of any occupation which is not recognized as a man's job. I believe that in the vast majority of cases the results obtained by embroidery work are bad in the last analysis. There are so many things available with all the advantages of this work, and none of its disadvantages.

Dr. Herbert J. Hall has said:²

After some 13 years' experience with therapeutic occupations, it is very plain to me that short of actual drudgery the more useful the work the better its therapeutic effect; and conversely, the more trivial and valueless the product of the work, the less effective will it be in the therapeutic sense.

Ward occupations have one grave danger, and one to which the enthusiastic teacher is particularly liable. It is the tendency to keep a patient at ward occupations too long. The teacher who sees him

¹ See report of Augustus S. Rose on ward occupations in jewelry making as training for jewelry trade.

² Modern Hospital, June, 1917.

responding and developing is eager to keep on, and good work brings satisfaction and contentment to the man himself.

Ward occupations must be looked upon as a means to an end, never as an end in themselves. Their function is primarily to prepare for the next step in reeducation. It should be an inflexible rule that no patient should be kept at ward occupations who is capable of doing more, and no patient should be diverted or entertained who is capable of productive work, even in ward occupations. The entire process of rehabilitation is one of a continuous series of steps which must be viewed as a whole. The success of reeducation depends not upon any one step but upon the dovetailing of all and the continuity of the process.

Where occupational therapy has failed, and it has failed in many instances, failure may generally be traced to one of four causes. These are, first, employment of the wrong type of teacher, whose personality is not suited to the task, however excellent the training for it may have been; second, employment of a teacher with the right personality but who is untrained; third, lack of cooperation and understanding of occupation as a therapeutic agent on the part of the medical staff; and, fourth, a wrong economic policy on the part of directors and business administrators.

SHOULD MATERIALS BE FREE ?

The purchase of materials, their free distribution or their sale to the patients must depend upon the general policy of the workshop. There are those who believe that hospital occupations should be self-supporting; that, at least, the returns from the patients' work should pay for the material, if not salaries of teachers. War conditions and the uncertain market for products have necessitated the close of several shops dependent upon the sale of patients' work. The question might well be asked if some of these shops were hospital workshops in the correct sense of the word. To be sure, severely handicapped men were employed, and these men would undoubtedly have found competition with normal labor impossible, but many were able to work fairly long periods of time, and their work had a definite economic value. They were not strictly convalescing and were not receiving therapeutic occupational or vocational training for outside employment. Such shops resemble the Lord Roberts memorial workshops of England.

In Great Britain many disadvantages have accrued though a wish on the part of hospital administration to make curative workshops self-supporting.¹

A hospital workshop properly occupies patients who work for varying lengths of time and whose work may be of no economic

¹ Bulletin No. IV, Surgeon General's Office.

value but whose efforts at work are always of therapeutic and sometimes of educational value to themselves. In many cases the patients do not seem to properly value materials unless they pay for them, and by having the cost of materials covered the shop may be considered to be self-supporting. On the other hand, it has been found best in many hospitals to provide the materials for therapeutic work and to charge the patient only for the cost of material he wishes to keep.

The general experience in this country has been that self-supporting hospitals have sacrificed the therapeutic end for the commercial and that those shops which are most valuable from the medical point of view are not self-supporting but are looked upon as a necessary expense justified by their therapeutic returns. Because a hospital shop is not self-supporting it does not follow that there should not be sound business management in its administration, care of materials, ordering in large quantities, avoidance of waste, and strict accounting. The materials for the Bloomingdale Hospital for the year 1917 cost \$2,613.10.¹ This large expenditure was warranted by the beneficial results made possible. Dr. Brush, of the Burke Relief Foundation, has said that occupation costs, but it costs less than drugs and is far more effective.

In a hospital where occupation is prescribed it is sometimes difficult to make the patient purchase material. He may use the outlay in expense as a reason for not fulfilling his work prescription. Where the work is not prescribed but the occupation is dependent upon the patient's interest, his interest must not be allowed to lag by any expense attached. From all points of view it is expedient that the workshop be looked upon as a part of hospital equipment, that it be wisely and economically managed, that the patients be given materials according to their therapeutic needs, that they be encouraged to keep their work either for themselves or for gifts, that when the product is kept the patient shall pay for the materials, and that when materials are not paid for by the patient the product shall remain the property of the institution.

SHOULD PATIENTS BE REMUNERATED FOR WORK?

There is a wide difference of opinion on the advisability of remunerating the men for their work during ward occupations. The attitude is somewhat dependent upon the policy of the shop. There is no doubt that compensation stimulates the men. On the other hand competition between men of different capabilities and with different degrees of handicaps is pernicious. The experience in one Canadian hospital has shown that remuneration tends to make the men feel they

¹ Cost of women's department, \$1,450.46; cost of men's department, \$1,162.64.

are once more capable of productive work. No harmful competition resulted. In fact it is stated that the spirit of comradeship is so strong that men will stop their own work to help a friend earn more. The returns are so small that they can not cause trouble. They merely provided means for obtaining little luxuries and materials for presents.

The experience of this hospital has by no means been corroborated in other Canadian hospitals. One hospital was strong in its belief that remuneration demoralized the men and the spirit of their work. The men would work only for pay, and all interest centered in this feature. They absolutely ignored the fact that work was good for them mentally or functionally. In spite of efforts to sell the work on a strictly business basis, the compassionate plea could not be wholly escaped.

At the Muirdale Tuberculosis Sanitarium, in Milwaukee, remuneration of the men was discarded, not so much because of unfair competition as of its tendency to impair the value of the work prescription. The men are sent to the shops as a part of their treatment, and it is felt that they should no more be remunerated for exercise there than for exercise in the open, or for taking a drug. When they were remunerated dissatisfaction was felt if the work prescription prevented one from earning as much as another. The spirit and morale of the shop was perceptibly improved when regular remuneration was stopped, and men looked upon their work prescription as a privilege and a recognition of improvement.

Reports from European countries indicate that remuneration of patients has its advantages and disadvantages. The Royal Orthopedic Reserve Hospital at Nurnberg, Germany, has devised a clever way of utilizing the benefit of remuneration without its accompanying drawbacks. The money earned by the men is given to a charitable fund. A sign reads: "Your earnings will be used for the benefit of war invalids." A similar scheme has been in use in one district in Canada. The proceeds from the men's work are pooled and managed by a committee of officials and patients. The fund is used to buy little luxuries for the men themselves.

This problem is perhaps best solved in two American institutions which have developed occupational therapy upon a sound medical basis—the Bloomingdale Hospital and the Burke Relief Foundation, both at White Plains, N. Y.

At Bloomingdale Hospital the patients are given materials for their work. As a rule, they are eager to keep the articles made by themselves and pay the cost of materials. If they do not keep their work it becomes the property of the hospital and is disposed of at sales, the returns of which go to the occupational department in the hospital, not to the patients.

The special feature of the Burke Relief Foundation is what might be termed its "hospital spirit," which is an antidote for the usual institutionalizing of sanitarium life. This spirit of pride and interest in the hospital is brought about by the patients' contributing to it, and in work or play there is a wholesome community effort for a common purpose. It takes the form largely of working for the hospital, but when articles are made which the patients wish to keep they pay the cost of materials, and when they do not wish to keep them the articles are sold and the returns go to the "Heart Fund." The patients share alike in their pride and support of this fund. In no case does the patient receive remuneration for his work. Those patients, however, who are retained and become employees of the hospital are, of course, paid for their work. Thus the librarian, door man, and others are ex-patients.

The advantages of remunerating the men may be summed up to be:

- (a) Stimulation to work.
- (b) Proof of capability for productiveness.
- (c) Dignifying occupation by a monetary return.
- (d) Turning the attention toward greater productiveness.

The disadvantages are:

- (a) Danger of unfair competition.
- (b) Danger of sentimental market.
- (c) Danger of interfering with normal labor.¹
- (d) Danger of destroying effectiveness of work prescription.
- (e) Danger of focusing the men's attention on immediate returns instead of training.
- (f) Danger of losing therapeutic phase of the work.

The last two objections outweigh all the others in seriousness, for therapeutic results alone justify the work in the hospitals, while the encouragement toward training introduces into the management of the hospital workshop economic motives.

Whatever scheme may be adopted, ward occupations will fail and fall far short of their possibilities if their therapeutic significance is not the first consideration and their vocational possibilities the second. When these two are firmly established it may be possible by proper care and judgment on the part of the instructor to avoid the other dangers mentioned under disadvantages and enable the patients to derive some of the benefits of remuneration, if not by actual payment in cash, at least by the wholesome rivalry of games, play prizes, and support of a common fund. Fine quality of teaching and a practical occupation may be depended upon to secure the advantages of dignifying occupation and directing the men's thought toward future productivity.

¹ Objection urged against prison labor.

EQUIPMENT.

There are a few general principles to be considered in the selection of equipment. Equipment must be suitable to bedside work and to the workroom in the ward. It must, therefore, be easily portable. Bed tables which tilt to any angle, so that they may be adjusted to the restricted positions of the patients who have sustained various sorts of fractures, injuries, and deformities, bed, benches, hand vises, small looms, and frames which are set across the bed for net, hammock, and hooked rug making, permit a variety of occupations. Work which is untidy, such as molding in bed, should be avoided. The equipment for the entertainment instructors will depend largely upon their ingenuity, but puzzles, games, pictures, books, and kindergarten supplies will form a large part. School and textbooks will be used in the self-improvement classes. The material and tools for the crafts will be those used by the ordinary craftsman or school of applied arts. Special mention should be made of a small kit of jeweler's tools which are suited to bed use. The equipment for practical occupations is simple and easily secured.

RECORDS.

A daily record must be kept of the work of each patient, the kind of occupation, and the number of hours he has been at work. At first, while the occupation is chiefly diversional and entertaining, the patient should not be conscious of any formal record. As soon as he becomes sufficiently interested in the subject to make a real effort, or the doctor prescribes an occupation and the number of hours he may work, it should have the dignity and seriousness of a formal record. Moreover, the patient should keep the record himself. The discipline of keeping a time card is psychologically good for him and is a step toward his readjustment into civilian life. The aide assigned to his instruction must be responsible for the accuracy of the entries and should indicate her approval by her signature.

The first of the accompanying forms is suggested as a possible form for a patient's daily work record covering employment at any craft or practical occupation requiring materials. The patient should know the cost of materials, and the recording of this cost should tend to make him careful to avoid waste. He should be given a card for each new piece of work. Thus the card becomes a complete history of each article, showing the date begun and completed, the total number of hours, its cost, and its estimated value. When the patient keeps the article, he should pay for his material. Provision is made for recording the amount of his payment or, in case the patient does not keep the article, its disposal.

The second form shown is the record card when the patient's occupation is study. He should be given a card the first day of each month. The card thus becomes a monthly record showing the subjects studied and the number of hours spent on each.

The patient's daily work and study cards serve a purpose in recording the occupation of the patient and the number of hours spent. They do not indicate those more fundamental values of ward occupations which are of interest to the doctor and the vocational officer. The weekly condition and prescription card is suggested for this purpose. It is a weekly record of each case made out by the head aide or director of occupations. The entries are made each week after consultation with the aide assigned to the instruction of the case. This weekly conference with the aides in regard to each patient insures careful supervision. Provision is made for showing weekly changes in the patient's mental and physical condition, the doctor's instruction, the patient's type of occupation and his quality of work. Reference is given by number to the detailed work and study record cards, covering this period of work. Under "Observations" may be noted any special reactions and characteristics of the patient which may be of value to the doctor or the vocational officer when the patient is ready to progress to the curative workshop, to the vocational school, or to the placement office.

Daily work record card, ward occupations.

Card No......

Date of Issue.....

Article.....

Record of work.			Materials furnished.		
Date.	Occupation.	Hours.	Date.	Kind and amount of material.	Cost.
					\$.....
Total hours			Total		

Cost of materials paid.....

Date.....

Approved by aide.....

Daily study record card, ward occupations.

Month of..... 19....

Name.....

Card No.

Rank.....

[illegible]

Grand total.....

Approved by aide.....

Remarks.....

Weekly condition and prescription record, ward occupations.

Month of.....19....

Name.....

Date admitted.....

Rank.....

Dismissed.....

Hospital Registration File No.....

Aid assigned to case.....

[illegible]

Observations.....

Director.....

THE STAFF.

STATUS AND ORGANIZATION.

The teachers of ward occupations must have a definite status in the hospital and be a part of the military personnel. Civilian aides can not be so carefully supervised, and they do not have the proper authority, all of which lessens the effectiveness of their contact with the men, nurses, and medical staff. Whether the occupational thera-

peutists be selected from the nursing staff or from persons who have been specially trained for the work, the director of ward occupations should have the status of the head nurse and the instructors the status of the nurses. The nursing staff, however, must be in authority in all matters relating to the physical condition of the patients, and the patients' medical treatments and periods of rest must be the first consideration. The director of occupations must be directly responsible to the medical officers for the fulfillment of the patients' work prescriptions. These prescriptions must never be given or reported through the nurse.

Each ward will need a director of occupations, who must be held responsible for the conduct and efficiency of the occupation aides in the ward, as well as for all matters relating to cooperation with other hospital departments. The director must be responsible for all material requisitioning, accounting, and distribution, as well as for the disposal of the finished products. The doctor's occupation prescriptions must be given to the director, never to a nurse or ward aide. If this prescription is the result of conference between the doctor and a vocational officer and is definite to the extent that it states, for example, typewriting for a given period of time, the director has only to assign the case to the proper aide. If, however, the prescription reads, "Exercise fingers and relax overwrought mind," the director must consult with the vocational officer and refer to his preliminary survey in order to ascertain if it will not be possible, while fulfilling the doctor's instruction, at the same time to be developing the patient in lines that will be of future vocational value to him.

As the instruction in ward occupation is entirely individual, a large number of aides will be needed, approximately one for every 10 patients having some form of occupation or entertainment. As the demands are varied, the best results will be obtained by having the aides specialize so that they may perform one group of duties with skill instead of many indifferently well. They should be chosen so that one group is proficient in amusements, games, puzzles, story-telling, etc., another group skilled in the teaching profession, another in design and crafts, and another trained in commercial and practical subjects.

PERSONAL QUALIFICATIONS.

The proper selection and training of teachers for ward occupations is essential to their success. It is a new field and there is no precedent. An analysis of ward occupations, their purpose and possibilities, both from the medical and the educational point of view, determines to a large extent what must be the qualifications of those entering upon this new and highly specialized service.

The finest type of personality is necessary for this service. In the Maryland Psychiatric Quarterly for July, 1917, Dr. William Rush Dunton, jr., president of the National Society for the Promotion of Occupational Therapy, has gathered together the opinions of those who have had experience in teaching occupational therapy. The consensus of belief is that the personality of the instructor is the foremost consideration. Miss Gunderson, of the Bloomingdale Hospital, has said: "While I lay stress on good training for teachers of occupation, I think success in this line depends a great deal on personality and love for the work." Resourcefulness, adaptability, tact, sympathy, force, courage, and dignity are essential qualifications. There are many vague endowments which make up "personality." Those especially which make possible the "right contact" with the patients are included in the "social instinct" and are especially necessary for the occupational therapist.

The occupational therapist should be regarded by the patients as one of the hospital personnel. The contact between the patient and the occupational aide is not the same as that between the patient and nurse. The nurse ministers to his physical needs. While he is acutely ill his physical needs will be greatest, but as he recovers these will diminish and others develop. He will long for a bit of variety to break the day's monotony. His mind will return to the past and he will have hopes and fears, desires and dread for the future. This is the time when there is danger of his developing peculiar mental slants and the reactions characteristic of the returned man. The nurse, especially one trained in hospitals caring for nerve and mental cases, is keen to appreciate the dangers of these days. She provides for the patient to the best of her ability and welcomes the help of the trained occupational aide who has at her command a wide range of resources, entertainments, studies, crafts, and useful occupations. With the aid of these the occupational therapist builds upon the patient's hopes and desires, bridges the gulf between the hospital and the civil world, prepares patients to "carry on," and in every way ministers to their intellectual and social needs.

There is much the same difference, in contact with the patients, between the nurse and the occupational therapist that there is between the surgeon who deals with an acute condition and the physician who treats a long convalescent case, such as "shell shock." As Dr. Thomas W. Salmon has said:

It does not greatly matter whether the operating surgeon understands the personality of the soldier upon whom he is operating or not; whether or not the physician treating a case of "shell shock" understands the personality of his patient spells success or failure.¹

¹ Care and Treatment of Mental Diseases and War Neuroses in the British Army.

Too much can not be said about the professional manner and proper contact of the teacher with the patient, but the professional manner can be carried too far. The success of ward occupations, getting hold of the man and understanding his idiosyncrasies, depends upon the individual interest of the teacher in the patient. It is perhaps this individual interest which is the greatest help to the patient at this period. For the first time he feels he is not a mere cog in the Army machinery, of which the hospital is a part. The medical and nursing staff can attend to little more than his physical condition, and he is classified according to his disability. His temperament, his yearnings, his apprehensions, and all those characteristics which make him unlike his fellows are minimized necessarily in the hospital régime. The man craves human contact and the interest of some one in his particular problem, which he is sure is unlike any other. It is this need of the patient which is the strong hold of the occupational aid. If a professional manner is adopted which makes the patient feel that he is only a patient, the teacher will fail at the outset. The interest which makes the man feel that his is an individual case, that he is still a matter of care and thought to some one, and that there is the potential power within him to "carry on," is not to be confused with the pernicious personal interest which does not develop interest in the occupation for itself or its purpose, but which says to the patient, "Do this for me." It is a question whether work prompted by such a motive is not demoralizing rather than beneficial. Women have been urged for bedside work rather than men for the fact that the men patients will do for them what they would not do for another man. To employ women for such a reason is fundamentally wrong. She should be employed because she has the tact, sympathy, and patience, those qualities which make women nurses indispensable, and which are needed just as much by ward occupational aids as by nurses in dealing with sick men. The ability of women in this work has perhaps been best expressed by a patient in a large sanitarium, who one day said to the doctor: "You know, we fellows didn't like the idea of a woman teaching us. We thought it was silly and she wouldn't know how to use a hammer. But we think different now. It ain't teaching that counts, it's what she has done for us, and there ain't a man that could have done it like her." The successful teacher must possess that happy combination of professional manner and human touch which develops the patient's interest in the occupation and inspires him to "carry on."

"Social instinct" is perhaps even less capable of analysis than the "right contact" with the patients. Social instinct is not meant to comprehend social work as ordinarily understood. It is rather an inherent quality possessed by successful social workers and those

gifted in contacts with their fellows. So long as social work has dealt with the material causes of maladjustments, it has been successful in improving bad conditions and in relieving poverty and distress. When social work has attempted to probe into causes not material, into those which can not be classified under family budgets or even domestic relations, it has been less successful.

There is a psychological reason for this. In those extreme cases where the social worker is called the patient is apt to have one of two attitudes. Either he will not tell what he considers to be nobody's business or he is delighted to have an audience. This last group has lost all sensitiveness, pride, and self-respect, and without these there is little to build upon. Frequent social investigation in itself contributes toward this callousness. The attitude of mind of this group is typified by the statement of one of the workers quoted by Mr. Faries in the "Economic Consequences of Physical Disability": "They are so used to being investigated that they take it quite as a matter of course." The best social workers are appreciating more and more in dealing with the first group of patients, those who do not wish investigation of personal matters, that they secure more information by asking few questions and making no notes in the patient's presence. At best, however, the approach of the social worker is difficult. She has no natural contact, and the questions which attempt to secure the desired information fail to reveal that which the patient will not communicate. Maladjustments in the social background of the large majority of patients in a general hospital do not warrant the probe of the social worker. The patients never think of the personal details of their lives or the morale of their families as affecting their character, mind, and physical health. Many of these patients, however, have worries and thoughts which have a decided bearing upon their health. After all, the thought or worry can not be rated by itself for its effect. It is rather the reaction of the patient toward it which determines its intensity and degree of influence. The majority of these patients are reserved and sensitive about intimate and personal details. Reticience is particularly characteristic of the returned soldiers.

Teachers of ward occupations have a tremendous advantage over the social worker in their approach to all these patients. They need to ask no questions or hurt or put the patient on the defensive. They have a natural contact through the medium of work. Both they and their patients have definite objectives—the enjoyment of recreation, the mastery of a lesson, or the completion of an article. These seem far removed from the patient's personal life, his secret apprehensions and yearnings. Yet teachers who have the social instinct, who understand the human material with which they are working, are able to discern many of these personal yearnings and

apprehensions in the reactions of the patient toward his work. The teacher can build upon these bit by bit, and quite unconsciously the patient finds a new outlook and commences to make his own adjustments. It also not infrequently happens that a reserve which will have withheld vital facts from the doctor or investigator will break down completely in the course of the daily contact of work. The reason for this is simple—the patient is off his guard, and has come to lean upon the teacher who can lead him in his mental studies or untangle and straighten his crude manual efforts. Quite unconsciously on the part of the patient the simple occupation has become symbolic of his best efforts, and as the teacher has been able to help him in these, he looks to the teacher to untangle and straighten his bigger problems.

In order to meet successfully this phase of the work, the instructors of ward occupations must understand the deeper social values involved in their work, and know when to win the patient's confidence and when to help him keep his reserve. They must know that the value of the work never depends on the finished product, but that its real worth must be measured by the patient's endeavor, what it has cost him in mental effort, in initiative, in application, and will power. They must above all appreciate the potential possibilities of work for developing vision and for making personal adjustments to environment. It is this ability—this social instinct—which can make work interpretative of higher values. It is this quality and consecration to service which Dean Cullimore refers to as "inspiration," and which Dr. Richard C. Cabot has called "the contagion of personality."

NEED OF TRAINING.

However important the proper contact and the social instinct may be, together with those qualities which go to make up the desirable personality of the teacher of ward occupations, no personality can compensate for lack of training. Teachers of occupations must be no less highly skilled in their line than are doctors and nurses in theirs.

The problem is both a medical and an educational one, and it is apparent that the teacher of ward occupations must be trained in both lines. Many failures of ward occupations in the past have been due to the fact that the teacher was a nurse, untrained in methods of teaching, or a teacher, ignorant of the mental and physical condition of patients. The instructor should understand the psychology of the subnormal, and know something of the contributive physiological causes, as well as of indications of fatigue for a basis for the proper demands to be made of each patient. A knowledge of physiology, anatomy, and kinesiology sufficient to assist in remedial physical

occupation demands training in each of these lines. Teachers must know the subjects they are to teach in a thoroughly professional way. They must know something of teaching methods and have had experience in teaching the disabled. The hospital, with its patients in a critical condition in regard to future readjustments, is no place for a laboratory for experimentation.

It is therefore necessary that proper qualifications and requirements be set up for those who are about to engage in the instructing of ward occupations in a military hospital. These standards must be determined by the Federal Government just as it has set up a standard for doctors¹ and nurses.²

There are two possibilities open to the Federal Government to insure proper training and uniform requirements. The first is to establish its own training school as the Invalided Soldiers' Commission of Canada has done, and the second is to set up a standard of requirements which all schools training students for Government service must adhere to. These two methods are considered in detail in the following sections.

METHODS OF TRAINING TEACHERS.

ESTABLISHMENT OF TRAINING SCHOOLS—CANADIAN METHOD.

As crafts are the popular ward occupation in Canada, the Dominion Government has undertaken to train women in the arts in a six-months' course. The University of Toronto has been selected. The university provides the space, but the invalided soldiers' commission finances the project, not only paying the salaries of teachers but paying the students \$45 per month while in training. The contract made between the applicant and the invalided soldiers' commission includes the following paragraph:

I agree to remain with the invalided soldiers' commission for a period of at least one year after the completion of the course, and to serve in an institution in Canada as may be directed from time to time by the vocational branch of the department of soldiers' civil reestablishment.

The greatest precaution is exercised in the selection of women in regard to their character and personality. The entrance requirements and qualifications in order of their importance are:

1. Previous craft and teaching experience with regard to age.
2. Standing of people who recommend the pupil.

¹ To enter the Medical Corps of the Army the candidate must be a graduate of a medical school legally authorized to confer the degree of doctor of medicine, with at least one year's post-graduate hospital internship. *Journal of the American Medical Association*, Apr. 13, 1918.

² The Senate passed Senate bill 3093, prescribing the personnel of the Army Nurse Corps, the qualifications for appointment, pay, allowances, and leave, and the conditions under which nurses may be retired. *Journal of the American Medical Association*, Apr. 6, 1918.

3. Good education and health. It is desired that they be university graduates.

4. General suitability and enthusiasm for the work.

The student is under probation during the course of training and for two months after, and should she not prove desirable in every respect the invalided soldiers' commission may discharge her. A paragraph in the contract between the applicant and the commission reads:

It is understood that, while training and for two months thereafter, I am upon a probation from week to week, that my engagement may be terminated upon a week's notice, and after probation period upon one month's notice.

The course consists of training in the following crafts: Basketry, weaving, woodworking crafts—this runs all the way from simple chip carving to toy making; metal working, including beaten brass and copper work; leather work, including bookbinding; textile crafts, including stenciling and block printing; the drawing crafts, which include pen and ink, water color, design, and illustration; and clay modeling.

The full course covers six months, divided into four semesters of six weeks each. During the first half of the semester, the pupil gets nine lectures on theory of design, six lectures on the problem of the invalided soldier, three weeks' actual practice in the various crafts, and at the beginning of the fourth week starts specialized training in two crafts. The choice of specialization depends upon the aptitude shown during the first three weeks, and is also governed by the needs of particular hospitals.¹

The hours are from 9 to 12 and 1.30 to 4.30. The first and third six weeks are spent entirely at the University of Toronto. The second and fourth six weeks are spent part time in the hospital and part time in school.

The following syllabus for the six months' training course was suggested June 1, 1918:

First session, six weeks—

Practical instruction in two types of handcraft work, one major and one minor. This to include instruction by the staff in the preparation of lessons on plans.

Six lectures on elementary psychology—

Factors of mental growth.

Laws of association.

The concept.

Six lectures on method in teaching—

Inductive and deductive reasoning.

Teaching as causing to learn—

The expository method.

The practical method.

The formal steps in teaching.

¹ Outline of course, University of Toronto.

Second session, six weeks—

Practical work in hospitals.

Pupils will also draw up and submit to the faculty a number of lesson plans, showing methods of presentation and development of the topic.

Six lectures on psychology of the abnormal—

Consciousness.

Memory.

Association of ideas.

Judgment.

Attention—

Training of the attention.

Habits of attention.

Disorders of perception.

Illusions.

Hallucinations.

Third session, six weeks—

Further instruction in manual work and practice teaching.

Six lectures on psychology of the abnormal—

Personality.

Suggestibility.

Impulses.

Exaltation and depression.

Alteration of personality.

Mental disorders.

Melancholia.

Dementia.

Hysteria.

Arrest of mental development.

Six lectures on problems connected with the education of invalids.

Special problems—

The method of the psychological study.

The keeping of the psychological records.

Compulsory supplementary reading—one book.

Fourth session, six weeks—

Practical instruction in handicraft and practice in teaching.

Lectures in psychology of the abnormal continued.

Special teaching methods in the instruction of convalescents.

Supplementary reading—two books.

Submitted work by pupil—one complete case history, one original thesis.

Extra lectures—

War shock.

Special problems connected with instruction of the blind.

Hospital problems, etc., will be inserted throughout the course.

The foregoing is comprehensive in its study of the medical phase of the problem. It provides a three months' part-time hospital experience. The time given to the study of craft and design is not sufficient to make either good craftswomen or designers out of novices, but the commission is making possible a high quality of craft and design work by considering first those women who have already been grounded in these lines. The time for craft and design may thus not be used to teach the technicalities of these subjects, but rather to illustrate methods of teaching craft to the sick.

**STANDARDIZATION OF TEACHER-TRAINING REQUIREMENTS—METHOD
SUGGESTED FOR THE UNITED STATES.**

An alternative method open to the Federal Government to insure adequately trained occupational therapists—alternative; that is to say, to the Canadian method of setting up a special training school—is to set up requirements which all schools must meet which are training graduates for Government service. Those requirements reduced to the minimum can not be less than:

1. Six weeks' study of the medical aspect of occupational therapy.
2. Three months' hospital training under supervision.
3. Thorough professional training in the line the applicant is to teach.

In addition to these requirements it is desirable that the applicants be well educated, college graduates, if possible; that they have an understanding of the economic and social significance of their work, and that they shall have had already a teaching experience in their line, quite aside from the technicalities of instructing the subnormal.

It is absolutely necessary that the Government set up standard requirements to safeguard the teaching of ward occupations. A grave danger threatens this service in this country. A few months ago, when it became apparent that there would be need for occupational therapists, many young women rushed headlong into short courses of training. All kinds and types of schools in various parts of the country established courses to meet the demand. There was no uniform course. Each school set up its own ideas of training. Many of the faculty called upon to teach this new subject had had no preparation themselves. Some had never had any hospital or medical training or any contact with the subnormal. Others who had this experience knew nothing of educational methods or the underlying theory. Some of the schools offer only theoretical courses, others only practical work. One school teaches basketry, weaving, pottery, rug making, leather work, and woodwork in six weeks. There are no entrance requirements to make a previous knowledge of craft necessary. So the herculean task is attempted of teaching all these crafts to the uninitiated in six weeks. Not more than the elementary stages of any one of the crafts could be mastered in that length of time. Fortunately, there is no mention of design, and it may be concluded that this vital phase of craft work, with its therapeutic and educational value, is omitted. As if the study of all the crafts in six weeks were not sufficient, the course also provides instruction in games and amusements, purchase of materials, disposal of products, advertising, economic value of occupational therapy, organization of shops, card-catalogue system, and history of the occupational therapy movement. Such an outlay of subjects would be ridiculous were it not pathetic

and attended with the present serious consequences of flooding the country with poorly trained and misinformed young women seeking hospital positions.

This country has resources of a supply from which occupational therapists may be recruited. Art schools for the past few years have been turning out many hundreds of graduates of four-year courses in design and applied arts. In addition, many of these graduates have had teaching experience. If occupational therapists are to be trained quickly and thoroughly, it is obvious that time may be saved by taking these graduates already proficient in craft and design and giving them a six weeks' intensive medical study of the problem of rehabilitation, a two weeks' course of lectures on its economic and social phases, and three months' practice teaching in hospitals under direction. These students should receive instruction in mental and nervous disorders; finger, arm, and shoulder movements; relation of occupation to massage; orthopedic surgery and mechanotherapeutics; symptoms of fatigue; danger of wrong exercise and overexertion; kinesiology; adjustment of work and materials to restricted position; the intelligent use of back rests, pillows, and braces at the foot of the bed in relation to the patient's position at work; and the cultivation of the play spirit, when to use it, and when to substitute conscious effort.

Occupational therapists capable of teaching practical subjects may be readily recruited from the ranks of business college graduates, from persons who have had office experience and professional training in stenography, bookkeeping, drafting, etc. Teachers of experience may be found for the self-improvement classes in the teaching profession. There are also women gifted in the art of entertaining. All of these possible candidates should qualify for hospital service by taking the same intensive course of study required of the teachers of crafts. This will include three months' hospital experience in order to learn the technicalities of teaching the disabled and a study of the medical problems of occupational therapy. This will mean in many cases the discarding of formal teaching methods and adapting the instruction to each case. At first it may consist chiefly of taking the play attitude toward all occupation, but in the end there may be a seriousness and purpose in teaching these mature men which is not possible with schoolboys.

The question arises, can not nurses already familiar with the hospital and used to contact with the sick, be trained even more quickly than these others for teaching ward occupations? In their case, the intensive study of the medical problem and the three months' experience in the hospital could be omitted. Instead they would have to be trained in a technical line. For women with a gift at entertaining, or who are already highly educated with a knowledge of teaching

methods, it might well be done, but the training for crafts or practical lines requires a long thorough course. The success of these subjects, both educationally and therapeutically, depends upon their being well taught. Two years would be the minimum time for those not specially gifted to acquire a teaching knowledge of the crafts suitable for ward occupations. The scarcity of trained nurses and the length of time required to master a subject, together with the abundance of women already trained in these arts, makes it possible to prepare the craftswomen in less time than it would take to train the nurses to become expert ward occupation teachers.

Nine months to a year of intensive training would enable well-educated candidates of exceptional ability to become proficient in a technical line and at the same time give them the necessary theoretical and medical study together with a hospital teaching experience.

If the second possibility of permitting the schools to train candidates for Government service is adopted, it should be left to the individual schools to determine the length of courses they would offer according to the entrance requirements they demand. The essential feature is that wherever or however these candidates are trained, they shall meet the requirements set up by the Federal Government. In order to attain this result the Government must reserve the right to pass upon the course of study and the qualifications of the teaching staff.

While training is essential, in the last analysis, nevertheless, only those must be selected for training who possess desirable personality. Time and effort might be conserved if those who wish to train for Government service should be passed by the Government before undertaking the training. Their ability, achievements, personality, health, education, and references should be considered. It should be understood that the Federal Government assumes no responsibility in passing them. They are merely eligible for training. Upon completion of training, only those who have shown marked ability as occupational therapists should be listed as candidates for service in military hospitals.

PUBLICATIONS OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

Annual Report.

The Vocational Summary, published monthly by the Federal Board for Vocational Education (Vol. 1, No. 1, May, 1918).

Bulletin No. 1. Statement of Policies.

***Bulletin No. 2. Training Conscripted Men for Service as Radio and Buzzar Operators in the United States Army (International Code).**

Bulletin No. 3. Emergency Training in Shipbuilding—Evening and Part-Time Classes for Shipyard Workers.

***Bulletin No. 4. Mechanical and Technical Training for Conscripted Men (Air Division, U. S. Signal Corps).**

Bulletin No. 5 (Reeducation Series No. 1). Vocational Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 166.)

Bulletin No. 6 (Reeducation Series No. 2). Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 167.)

***Bulletin No. 7. Emergency War Training for Motor-Truck Drivers and Chauffeurs.**

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Bulletin No. 13 (Agricultural Series No. 1). Agricultural Education—Organization and Administration.

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Bulletin No. 15 (Reeducation Series No. 3). The Evolution of National Systems of Vocational Reeducation for Disabled Soldiers and Sailors.

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Bulletin No. 17 (Trade and Industrial Series No. 1). Trade and Industrial Education—Organization and Administration.

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Bulletin No. 22 (Commercial Education Series No. 1). Retail Selling.

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Bulletin No. 24 (Commercial Education Series No. 2). Vocational Education for Foreign Trade and Shipping.

Bulletin No. 25 (Reeducation Series No. 4). Ward Occupations.

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The Federal Board for Vocational Education, Washington, D. C.

*** Emergency war training for conscripted and enlisted men.**

BULLETIN No. 26

AGRICULTURAL SERIES
No. 4

AGRICULTURAL EDUCATION

SOME PROBLEMS IN STATE SUPERVISION

State Supervision

State Supervision and Teacher Training

Professional Improvement of Teachers in Service

ISSUED BY THE
FEDERAL BOARD FOR VOCATIONAL EDUCATION
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December, 1918

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FOREWORD.

By the provision of the Vocational Education Act the Federal Board for Vocational Education deals with the work done in the State only through a State board which is created or designated by legislation in the State itself.

Part I of this bulletin points out those factors which are essential for the success of the State plans for vocational agricultural education, supervision, and teacher-training being the two greatly stressed. The duties of the State supervisor are twofold. He must both render assistance to the teachers and at the same time check up their work. This dual responsibility can only be successfully assumed when the cooperation between teacher and supervisor is strengthened by a close personal relationship. It is impossible to set up absolute standards for administration and supervision which will be suitable to the needs of all the States, but the bulletin outlines in a general way the directional and supervisory duties which a complete system involves.

One of the great responsibilities of the State board is the training of teachers. The bulletin explains the proper ways in which Federal funds may be made available for the supervision of teachers already in service as well as for the training of new teachers.

In Part II there is a discussion of the relationship between teacher-training departments and State supervisors. Two plans of organization are described. In the first of these the supervision and teaching are both under the direction of one person. In the second the responsibility is divided. The advantages of the second plan are pointed out and suggestions are made as to the proper organization of the work.

Sectional conferences and periods of professional improvement work for teachers of high-school agriculture is the subject of Part III. The qualifications and aims of the successful teacher of vocational agriculture are outlined in this section, and emphasis is laid upon the need for the teachers to be able to do as well as to know. As in every other profession, there is always something more to be learned, and every instructor must keep abreast of the times. The bulletin shows how this "professional improvement" may be obtained through work with the farm management specialist of agricultural colleges, through the relationship of boy's club work, and through research and extension work. With the aid of these agencies,

instructors will become better skilled in farming, will gain a more intimate knowledge of young boys, and will be better posted as to sources of agricultural information.

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Director.

PART I.

STATE SUPERVISION OF VOCATIONAL AGRICULTURAL EDUCATION.

ESSENTIAL FACTORS IN THE SUCCESS OF A STATE PROGRAM OF VOCATIONAL EDUCATION.

The two most important factors in the success of a State program for vocational education are supervision and teacher training. Proper provision for supervision and an adequate plan of teacher training in operation insure success.

The Federal Board is concerned with State administration and supervision, because the State boards are the cooperating agencies with the Federal Board for the promotion of vocational education. The Federal and State boards become partners in carrying out the provisions of the act. The duties of each partner are specified in the law. The success of a partnership depends upon the ability of each member to carry out his part of the agreement. The provision which a State makes for administration and supervision is the best single index of the ability of the State to carry out its part of the agreement set up under the terms of the vocational education law.

The State board is concerned with State administration and supervision, because the State has placed upon the board the responsibility of cooperating with the Federal Board in the promotion of vocational education in the State and because the State and Federal Governments have placed upon the State board the responsibility of disbursing Federal (and State) funds to schools which meet certain specific requirements and conditions. A State board can perform this double task of promotion and inspection only through representatives who are qualified by training and experience to encourage and stimulate, to advise and assist, to inspect and suggest, to approve and disapprove.

Both the Federal Board and State boards are vitally concerned with the question of so equipping the State board as to enable it to discharge properly the responsibility placed upon it by the State legislature and Congress and to maintain its own prestige in the State. There has been much discussion to the effect that vocational education would be unable to maintain its standards and justify its existence if administered by the same board which administers the general education of a State. The sure way to prevent any such

occurrence is to provide the Board with a trained staff upon whose recommendations they can rely. Such a provision would also have a salutary influence upon the attitude of the State toward proper assistance to the Board in the administration of general education.

In 32 States the State board of education has been designated as the State Board for Vocational Education. In nine States there is no State board of education. With two exceptions the executive officer of the State Board for Vocational Education is either the State superintendent of public instruction, the commissioner of education, State superintendent of schools, secretary of the State board of education, or the chairman of the State board of education.

QUALIFIED STAFF A NECESSITY.

Some States have made temporary arrangements to secure supervision and inspection through instructors detailed from State institutions or through the use of persons already in the employ of the State board in some other capacity. In view of the foregoing facts is it not a sound principle that, as soon as possible, a well-qualified supervisory staff should be employed, paid and directed by the State board?

What is the minimum staff of a State Board for Vocational Education necessary to secure proper administration, good supervision, and thorough inspection of all institutions to which reimbursement is to be made from Federal funds?

WHAT THE SYSTEM WOULD INVOLVE.

No absolute standards for administration and supervision may be projected for the country as a whole; what is adequate for one State might be entirely inadequate for another. The provisions which a State makes will necessarily depend upon conditions in that State. It should be noted, however, that the number of schools in operation is not the sole mark of need of supervision since the promotion side of supervision in some States may be more needed than the actual inspection of schools under way.

A complete system of State administration of vocational education would involve the following duties:

Directional:

- (a) Outlining policies to present to the State board.
- (b) Preparing State plans (with assistance of specialists).
- (c) Directing the promotion of vocational education.
- (d) Medium, between State and Federal boards.
- (e) Directing work of vocational staff.
- (f) Preparing forms for reports of vocational schools and teacher-training classes.

Directional—Continued.

- (g) Recommendations to State board regarding schools and classes for approval and reimbursement.
- (h) Bringing together all parties interested in vocational education to the support of a State program.
- (i) Educating the State as to the meaning of vocational education.

2. Supervisory:**A. Fields of supervision.**

- (a) Agriculture.
- (b) Home economics.
- (c) Trades and industries.
- (d) Teacher training.

B. Duties within each field.

- (a) Assist the directive officer in special field.
- (b) Inspect schools.
- (c) Assist teachers in improving work.
- (d) Studying conditions of State in special line with a view to recommending establishment of schools or classes.
- (e) Assisting in establishment of schools or classes.
- (f) Preparing bulletins and other special literature.

STATE BOARD RESPONSIBLE FOR TRAINING TEACHERS IN SERVICE.

It has been shown that the State board is responsible for supervision of work within a State. It follows that the improvement of teachers in service is the work of the State board. In the carrying out of this task it may be advisable to have the assistance of a person or persons from a teacher-training institution, but the responsibility is still with the State board and its agents for the assistance and guidance of teachers in service.

USE OF TEACHER-TRAINING FUNDS FOR SUPERVISION AND TRAINING OF TEACHERS IN SERVICE.**(a) Conditions stated by the Federal Board for guidance of State boards.**

At the meeting of the Federal Board for Vocational Education on July 11, the following was voted:

That State boards be authorized to use teacher-training funds for the maintenance of teacher training and supervision on the following conditions:

1. That a plan of supervision be set up by the State board and approved by the Federal Board.

2. That the qualifications of supervisors be set up by the State board and approved by the Federal Board.

3. That all supervisors employed in connection with supervision for the maintenance of which Federal funds are used, shall meet the qualifications set up by the State board and approved by the Federal Board, and that such supervisions shall be employed by and responsible to the State Board for Vocational Education.

4. That not more than 25 per cent of the maximum which may be used for teacher training in any one of the three lines—trades and industries, home economics, and agriculture—be used for the maintenance of supervision in that line.

(b) Suggestions to State boards.

The following suggestions are made to assist State boards in preparing plans for supervision which will include the training of teachers in service:

1. *The plan.*—The plan should provide for—

A. Improvement of teachers in service.

(a) Systematic visitation of teachers or local supervisors for individual help.

(b) Definite reports from the teachers or local supervisors to the State supervisor on work done and methods of instruction used. In order to have these reports result in benefit to the teacher, the supervisor must provide for careful criticism and reports on the same to be sent back to the teacher or supervisors.

(c) State and sectional meetings of the teachers at which the supervisor may himself give instruction or provide other instruction.

(d) A period of professional improvement for teachers.

(e) Cooperation between teacher-training institutions and the State supervisory staff so that all teacher training may be coordinated.

B. Inspection of schools.

C. Assistance in the establishment of new schools and classes.

D. Preparation of bulletins and other special literature.

THE QUALIFICATIONS OF SUPERVISORS.

One of the most important functions of the supervisor is assisting teachers in their work. The qualifications of supervisors in any given field then should at least meet the standards set up for teachers in that field. In addition, supervisors should have had at least one year of successful experience in teaching in that line. It is also necessary that supervisors have a knowledge of the field of vocational education and be fully conversant with the latest developments in vocational education.

SUPERVISION A FUNCTION OF THE STATE BOARD.

If teacher-training funds are to be used for forms of teacher training which include supervision of schools or teachers, the plan of supervision should show that the persons performing this double function are directly responsible to the State board. The State board can not delegate its supervisory responsibility to an institution or to another board.

THE MAXIMUM AMOUNT OF FEDERAL FUNDS TO BE USED.

The maximum amount of the teacher-training fund which may be used in any fiscal year in any one of the three lines is 60 per cent of the total amount allotted to the State for that year for teacher training. Twenty-five per cent of this maximum in any one of the three lines is 15 per cent of the total teacher-training fund.

For example: Suppose the total amount of Federal moneys for teacher training in all lines allotted to a State for a given fiscal year is \$10,000. Since 60 per cent of this, or \$6,000, could, under the act, be used for teacher training in agriculture, or in trades and industries, or in home economics, then it is possible under paragraph 4 above to use 25 per cent of this \$6,000 (60 per cent of the total), or \$1,500, for the supervision of instruction throughout the State in agriculture, \$1,500 for the supervision of instruction in trades and industries, and \$1,500 for the supervision of instruction in home economics.

This would give a possible total of \$4,500 for the supervision of teachers in service, leaving \$5,500 for the preparation of teachers for service.

Since the moneys from the teacher-training fund used for the supervision and the training of teachers in service can be used for the same purposes in such supervision as the moneys used for other forms of teaching training it follows that the teacher-training money used for such supervision may be expended for these purposes: Salaries of supervisors, clerical service, travel, communication, printing, and supplies.

THE STATE SUPERVISOR OF AGRICULTURAL EDUCATION.

A State supervisor of agricultural education has, in the main, two duties: Assisting teachers who are already in service and assisting communities which have already started to do something in the way of offering instruction in agriculture, or which have signified a desire to initiate a program of agricultural instruction. In the discharge of this duty a State supervisor is in a way a missionary in the State. He is an itinerant teacher of teachers—a stimulator of teachers of agriculture. He should also be a stimulator of communi-

ties, putting before the people of a community the possibilities of vocational agricultural instruction, and assisting these communities to establish satisfactory schools or courses in agriculture.

Along with this stimulating duty a State supervisor has the onerous duty of checking up the work of teachers or schools. Acting in this capacity, provided he is administering a system of education in which the State has a responsibility for the success or conduct of a school, he is a policing officer charged with the duty of determining whether or not the school meets the standards set up for the State. This work is largely in the nature of inspection, and the responsibility for it is always increased where the State is putting money into the enterprise. It is fair to assume that this part of a State supervisor's duty is determined largely by the standards and policies adopted by the State, or by the board which the supervisor represents.

CONFLICTING DUTIES.

As a result of this dual responsibility of carrying on missionary work and policing or inspecting, the supervisor is confronted with conflicting ideals. In his capacity as a missionary he is desirous of taking into consideration the effort and intent of the community, while in his capacity as an inspector he is charged with the responsibility of measuring the conditions as they exist regardless of what is promised for the future or what has been the record of the past. On the one hand, he is confronted with the task of setting up a vision and of assisting people to that vision, and, on the other hand, he is confronted by law or rules and regulations which say, "These things must be done." The supervisor then either has to become a party to a breaking or disregard of the letter of the law or to lower his ideals of assistance to a community by bringing them to an observance of the letter of the law regardless of the intent and spirit of the community.

There are, however, certain compensations resulting from this dual responsibility. The existence of certain standards by which to measure the work of schools tends to keep the ideal of vision within the realm of possibilities, and on the other an ideal and a spirit of service and assistance tends to make a law or rules and regulations a means to an end rather than the end itself. In other words, the wise State supervisor will regard the conditions imposed upon a community for the establishment of vocational schools in the light of an attempt to secure the conditions which are essential for satisfactory work.

A supervisor who merely sees to it that the community has the minimum amount of equipment and the minimum conditions for carrying on vocational work without regard to the proper use of

such equipment, or taking advantage of the conditions, is not a supervisor in the best sense of the word.

The law and rules and regulations are but mechanical standards and represent only material ideals. The supervisor as a living vital force must supply the real standards of attainment and success in the work as the final end and aim of the school.

PERSONAL RELATIONSHIP BETWEEN SUPERVISOR AND TEACHER.

The establishment of a close personal relationship between the State supervisor and the teacher of agriculture is the most effective way of securing a transmission of ideals from the supervisor to the teacher. In other words, the question of doing missionary work, of giving assistance to the teacher, resolves itself primarily into the question of the supervisor actually going to the school and getting acquainted with the teacher, talking over the problems of the school with the teacher, and getting from the teacher information which could not be secured by any kind of a written report or tour of formal inspection.

This personal relationship between the teacher and the supervisor will be of great assistance not only to the teacher but to the supervisor. A supervisor can say a great many things to a teacher which he could not write to him. He can tell him those things in person in a way that will make the teacher feel that the supervisor is there to assist him rather than merely to criticize him. If the supervisor visits the school and becomes intimately acquainted with the problems which the teacher is facing, he will withhold the criticisms which might be made if only a formal report of the conditions were made.

This condition of personal relationship should exist not only between the State supervisor and the teacher but between the teacher and the pupil. It is after all only a restatement of the generally accepted idea that a knowledge of the other man's problem often-times does away with the criticisms which otherwise might be passed upon it.

A thorough understanding of the conditions under which a teacher is working not only enables a supervisor to give assistance which is to the point, but also enables the supervisor to judge whether or not the spirit of vocational instruction is being carried out as well as the letter of the law under which such instruction is established.

ASSISTANCE TO TEACHERS.

The following are some ways in which the supervisor might give assistance to the teacher of agriculture:

(a) The supervisor should assist the teacher to improve his methods of instruction and his organization of the material which

he presents to his classes. The greatest difficulty which confronts the teacher of agriculture is not a lack of knowledge concerning the science of agriculture, but rather a lack of knowledge of how to organize his instruction in such a way as to present it to his classes effectively. It is generally conceded that the subject matter of agriculture should be organized from the standpoint of the community in which the school is located, that is, from the standpoint of the community and the standpoint of the pupils, taking the knowledge of agriculture and translating it into terms of the locality. For instance, if there is a dominant breed of stock in the community, it would seem to be the part of wisdom for the teacher of agriculture to use this breed as the basis of his instruction in animal husbandry in so far as it dealt with that particular branch of animal husbandry.

There will be available, both in the textbook and in the mind of the teacher, much more information concerning many topics than there is time to present to the class. A supervisor should be able to assist a teacher in so organizing his instruction that topics of minor importance will be given less time than topics of major importance. The supervisor can be of great assistance to a teacher in the preparation of outlines, directions to pupils, the proper conduction of field trips, the use of laboratory and field exercises to coordinate the project instruction, what material can be used for demonstration work, what farms of the community may be used for visitation, and the value of such visitation. All of these helps can be given only through personal interviews with the teacher. This means that the supervisor should plan to stay long enough at a school to enter into the spirit of the instruction in the school and understand what the possibilities of the school are.

(b) A supervisor can be of a great deal of assistance to a teacher of agriculture in suggesting arrangements of his room, the arrangement of the furniture in the room, furniture needed, laboratory equipment needed, demonstration material which may be purchased or collected in the community. The preparation of a standard list of equipment is only one step toward securing the proper equipment in a school. Unless the supervisor can talk with the teacher about the need of certain kinds of equipment there is not much use in having the school purchase it.

(c) One of the greatest helps that the supervisor can give to the teacher of agriculture is to describe the work which is being done in some other school or schools. This is always an inspiration to the teacher and a stimulant to him. Almost invariably he will ask what there is that he can do that will compare with the enterprises described. A concrete example of what the supervisor has seen in another school carries a great deal more weight than any

general description of ideas or ideals. Then if the supervisor knows the conditions under which the teacher is working it will probably be possible for him to suggest to the teacher new methods or new ways of presenting subjects.

(d) The amount of help which a supervisor can give to a teacher by correspondence as compared to what he may give by visiting the teacher is very limited, yet certain helps can be given by correspondence. One of the most delicate problems that a State supervisor has to face is that of knowing just when to write a formal insistent letter to the teacher of agriculture saying that certain things must be done. It may be that it is a question of reports coming in late or in poor shape; it may be a question of getting proper outlines prepared for the courses given. A good formal disciplinary letter once in a while is a mighty good thing, but too much of it administered without a very careful diagnosis of the case is dangerous, because, after all, the success of the work of the State supervisor rests primarily on having the teachers of the State feel that the State supervisor is their helper and friend rather than their director and disciplinary officer. The supervisor can learn more from a friend on the job as to the things needed to make the work in that locality strong than he can learn from an enemy on the job who has the feeling that the less the supervisor knows about what is going on the less fault will be found. The writing of letters which will convey helpful criticisms is a very delicate task. Undoubtedly a supervisor should have two kinds of correspondence with the teachers—(1) official, formal correspondence, and (2) informal correspondence through which the teacher may place his troubles freely and frankly before the supervisor and in which the supervisor may correspond with the teacher as his friend and fellow worker. Ninety-nine out of every hundred teachers are anxious to succeed and make the work worth while. Whether or not it is a success depends largely upon whether or not the supervisor and the teacher working together can find the weak points and the way to strengthen these points. The supervisor with his wider experience will be almost invaluable in pointing out these weaknesses, provided the teacher feels free to put the facts before him.

(e) Publications can be made very helpful to teachers of agriculture. A description of work which has actually been done, illustrated with pictures of things as they existed, will do a great deal of good. Official rules and regulations have to be published. They are trying things because they have to be lived up to. Nevertheless, it is essential that both the supervisor and the teachers understand thoroughly the requirements for carrying on the work. Furthermore, it is usually the board of administration of the school rather than the teacher of agriculture with whom the supervisor has to deal in getting proper

plant and equipment. The publication of forms and blanks for the use of teachers and pupils is oftentimes of great assistance.

(f) One of the most helpful things that a State supervisor can do is to hold conferences with groups of his teachers. These conferences might well be of two kinds. Regional conferences at which a few of the teachers meet with the supervisor in round-table discussion where freely and informally troubles and successes are talked over. No papers are presented or formal speeches made. These conferences dealing with local issues should serve to put the teachers in touch with what other teachers are doing in the same general section. It should always be remembered that the teacher of agriculture in a department of a high school is in a way an isolated being in that he does not come into contact very frequently with any other persons who are engaged in the same line of work in which he is engaged. These regional conferences whether attended by the State supervisor or not are valuable for the purpose of keeping alive the professional spirit of the teacher. There ought to be at least once a year a State-wide conference at which general policies are discussed. The wise supervisor will take the teachers into his confidence and formulate his rules and regulations and general policies upon a basis of suggestion and discussion by the teachers. A group of teachers who are actually performing the work are the very best source of information as to what rules and regulations and methods of procedure are workable. When these are once established the supervisor will get from the teachers his best hints concerning what modifications are necessary and how fast he can go in advancing ideals.

(g) A supervisor ought in every legitimate way that does not really compromise him as a State officer see to it that the teacher of agriculture gets a salary commensurate with the service which he gives. If the teacher is doing his work well and performing satisfactory service, the supervisor should call this to the attention of the employing board and recommend to them that they recognize this loyal and efficient service in a material way, that is, by paying a salary commensurate with the service. On the other hand, if the work of a teacher is of poor quality and the supervisor is unable to get any response to his efforts to improve the work, the board of employers should be notified and every effort used to have them secure the services of a competent man.

The supervisor should also feel in a way responsible for getting before the board any questions relative to needed improvements in the plant or equipment and should spare no effort in giving to the teacher proper facilities for work.

Since in the carrying on of a system of home projects it is absolutely essential that the teacher be equipped with means of transportation the supervisor should see to it, either through general State

regulation or through agreement between teacher and the board hiring him, that proper provision is made for such transportation.

The supervisor should also feel responsible for seeing that the time of the teacher is used to advantage during the period in which school is not in session. The supervisor should also feel responsible for seeing to it that every community provides a certain amount of money which will be available for the maintenance of the agricultural course. One of the greatest handicaps which a teacher of agriculture can labor under is that of constantly needing supplies which ought to be provided by the school.

PROMOTION OF AGRICULTURAL EDUCATION.

The State supervisor is in the State to promote agricultural education. It is his duty to the schools already established to assist the teachers and to inspect the schools. It is also his duty to extend to other communities of the State a knowledge of what is being done in the schools already established and to use his influence to get other communities to set up that type of instruction, provided always, of course, that it seems wise for such communities to establish vocational courses.

REPORTS.

Every supervisor must sooner or later give an account of his work to the State board under whose jurisdiction he is carrying on supervision. The adequacy or inadequacy of this report oftentimes determines both the attitude of the State board toward instruction in the schools and the extent to which the board will commit itself to the policy of extending supervision.

The success of a State system of vocational agricultural instruction depends upon two things—(1) a proper system of training teachers, and (2) a proper system of State supervision.

Even with effective teacher training the work in a State will not be coordinated and successfully carried on unless there is some other coordinating agency directly responsible for the progress of the work. In other words, the training of the teachers is an important factor in the success of a State system, but after all is of little value unless there is a proper system of supervision, since the supervisor is responsible both for securing proper conditions under which the teaching is to be done and for the improvement of the work of the teachers which have been prepared.

PART II.

RELATIONSHIP BETWEEN TEACHER-TRAINING DEPARTMENTS UNDER THE PROVISIONS OF THE VOCATIONAL EDUCATION ACT AND STATE SUPERVISORS OF AGRICULTURE FOR THE STATE BOARDS FOR VOCATIONAL EDUCATION.

TWO PLANS OF ORGANIZATION.

The organization of the two phases represented by supervision of the vocational work in agriculture and the preparation of persons to teach such agriculture may be on either one of two bases.

(a) The responsibility for both phases of the work, supervision of vocational agriculture and training of teachers, may be under the direction of one person. Such an arrangement is possible under the provision of the Vocational Education Act by making a proper division of the individual's time between the two fields in which he functions. This adjustment is to be found in several States at the present time.

(b) The supervisory function may be placed in the hands of one man and the responsibility for the preparation of teachers vested in a second individual. This at present is the more common of the two methods of organization.

Of these two plans the second will ultimately show greater strength as measured by the results accomplished in the teaching of vocational agriculture, and this must be regarded as the final measure because the act exists not to provide supervisors and teacher-training departments, except in so far as they are a means of improving the instruction in agriculture under the Vocational Education Act.

COMPARISON OF THE TWO PLANS OF ORGANIZATION.

This statement should not be interpreted as meaning that the organization which places both teacher training and supervisory functions under one head is without merit. There is strong argument for it. It gives the department dealing with the preparation of teachers an excellent opportunity to follow its product into the schools and to see at first hand the extent to which the persons that have been prepared are making good when they have assumed their responsibilities as teachers. This is, of course, the final measure of the success of the

teacher-training work. A defect resides in the fact that those who have prepared the teacher are likely to overlook what may be fundamental weaknesses in his work, providing the teacher is proceeding in accordance with the instruction received at their hands. The supervisor who is independent of the teacher-training organization will approach the work of the teacher with an unprejudiced attitude, and other things being equal he is more likely to see the faults of the teacher as they are exhibited in his work than he would be if he had been responsible for that teacher's preparation.

A practical difficulty is raised by combining the supervisory and teacher-training function in one person, because it is necessary for the supervisor to distribute his work over the entire year. He can not well have one semester for supervision and the other for teaching. This creates difficulties incident to having an instructor spend two or three days a week in the field and the remainder of the time in the classroom. Anyone who has tried this realizes that it is usually unsatisfactory. The supervisory work, because of the calls for assistance that come from the field, is the more insistent of the two, and as a result the teacher finds that the supervisor has robbed him of considerable of his time that he should have had for the organization and development of his instructional work. He is also without the time necessary to become intimately acquainted with his student body. Success in teacher training is dependent on a large measure of contact with the students in training and this comes only when those who are responsible for the work are readily accessible to the student body and have time to learn the strength and weakness of each prospective teacher. Some of the work of teacher training must be teacher selection.

It is quite within the range of possibility that a third feature might develop that contains an element of weakness when the two offices are combined. Naturally the supervisor is in a position of considerable influence in determining the teachers selected by school authorities. He would fall short of being human if he did not favor his own students. Under normal conditions with reference to supply of teachers this may result in more or less inbreeding. It would seem desirable that at least 15 to 25 per cent of the teachers of vocational agriculture in any State should come from outside the State. Especially will this be true when the vocational education funds have made possible the development of strong departments for the preparation of teachers in practically all of the States. This drawing of teachers from outside has its limitation in the fact that usually they can not be obtained to advantage from regions that have a widely different agriculture from that found in the State.

In spite of the difficulties that have been pointed out in combining the supervisory and teacher-training activities they are to be found

so organized in some of the States at the present time and it may well be that certain conditions within some States make this desirable. In general, however, the separation of these two functions will in the long run produce better supervision and better preparation of teachers, providing the proper relationship exists between the agencies responsible for these two lines of work.

SEPARATION OF TEACHER TRAINING AND SUPERVISION.

When the two functions are placed on essentially coordinate bases and are vested in different individuals, a broader point of view is brought to the problems providing the proper cooperation exists between those who are responsible for the training of teachers and those who are charged with the duty of supervising the instruction in the schools. This cooperation is not difficult to secure when the men occupying them are big enough and reasonable enough to be in positions of such responsibility.

Those who are responsible for the training of teachers should realize, so far as the work of administration and supervision of the vocational agriculture is concerned, that it rests in the hands of the State Board for Vocational Education and its duly elected representatives. The training department should in no way attempt to usurp this authority. Its members should go further and as a part of their preparation of prospective teachers should instruct them to look to the proper authorities for advice regarding procedure in questions involving administration. As has been indicated, it is necessary for those who are preparing the teachers to have an opportunity to observe the results of their instruction after the product is at work in the schools. But this opportunity may be secured without assuming any responsibility for administrative or supervisory functions.

TRAINING IN SERVICE.

Those who are engaged in the professional preparation of teachers recognize the fact that no matter how carefully their work is planned and executed, they can not hope to send forth teachers who would not be benefited by instruction after they enter upon their work. By use of the vocational education funds every State should be able to meet this need by improvement of teachers in service.

This work may be thought of as having two phases—(a) The informal work that every good supervisor does with his teachers for the purpose of stimulating their growth, and (b) systematic instruction that may very well be given every teacher during at least his first year of service. In States where a probationary year is required before the teacher is permanently certificated this training can be very satisfactorily connected up with the system of certification.

The State supervisor should take the initiative in developing the plans for this systematic training, but naturally he will wish to utilize the teacher-training staff in developing and carrying out its details. This work should be planned for and required of every teacher during at least his first year of teaching. Since it must be largely individual, it will be necessary for those who are carrying it out to visit the novice as occasion demands.

SUGGESTIONS REGARDING ORGANIZATION OF WORK.

In order that this visitation may work out to best advantage, the following suggestions are made:

1. The State supervisor should send a letter at the beginning of the year to the principal of each school in which there is a teacher receiving such training, informing him of the fact that this teacher will be subject to visitation by a member of the training staff.

2. During such visitation the representative should confine his work to the improvement of the teacher's technique of instruction as represented by his work with pupils in the field, laboratory, classroom, or at the project. The visits that are made should be of such duration that it will be possible to accomplish this result. If there are changes of an administrative nature that would result in improving the quality of instruction, these should be brought to the attention of the State supervisor who may take them up with the local authorities if he deems it wise to do so, but under no circumstances should the member of the training staff assume any responsibility for their correction.

3. Since the State supervisor will also endeavor to improve the instruction of his teachers he will be dealing with the teachers who are receiving training in service. For this reason it is desirable that the supervisor and those who are training teachers come to an agreement upon the fundamental principles that are to be observed in developing the work in vocational agriculture. When such an agreement is reached, there is little or no danger of great disparity in the advice that comes from the two sources.

4. A definite period of time (e. g., one year) should be set for this systematic instruction in service. The final decision as to whether or not it may be desirable to continue over a longer period with certain teachers should be determined by the State supervisor.

OTHER METHODS OF IMPROVEMENT IN SERVICE.

In addition to the individual assistance that will be given to all the teachers by the visit of the supervisor there is need each year of at least one conference that will bring together all of the teachers. There should also be local or group meetings. In arranging for these the initiative should rest with the State supervisor. Those

responsible for the training of teachers should expect and be willing to render every possible service that may contribute to the success of these conferences. If the State meetings are held at the institution where the training of teachers is done, it is possible for those in the institution to readily arrange for the services of instructors in the various technical subjects to provide exhibits of texts, references, bulletins, lanterns, and charts.

The State supervisor should have a part in the formal instruction that is given to the prospective teacher. Arrangements should be made by which he will have several lecture periods for the purpose of getting before the class his views regarding the work which they are planning to enter. These visits should be made the occasion for giving the supervisor an opportunity to have a personal interview with each student. He should also go over the records of each with the teacher-training staff. These interviews and intimate considerations of each student will do much toward getting the teachers into the communities where they can work more effectively, because the supervisor will know the difficulties that are likely to be met in the various sections of the State much better than they are known to those in the training departments. Those who are preparing the teachers will be familiar with the abilities and limitations of their students and can judge of their capacity for meeting special problems that are presented in certain communities.

AN ILLUSTRATION OF HELPFUL COOPERATION.

In New York State the department of rural education has been able to cooperate with the State supervisor in a special field that has been mutually helpful. The supervisor prepared blanks on which the teachers were required to make monthly statements showing by means of a daily record certain facts regarding topics studied, methods used, and references employed. These reports were assigned by the department of rural education to advanced students for detailed study with reference to time allotment to the various topics, seasonal sequence, and the relation between recitation, laboratory, field, and project work. One of the annual conferences was devoted largely to a consideration of the studies that had been made of the work that had been reported during the year. The results of these studies were found not only to be very helpful to the men who were already in the service, but they proved almost invaluable in the instructional work with prospective teachers. These reports contained much material that was very helpful to the supervisor but which it was practically impossible for him to organize because of lack of time.

In this presentation no attempt has been made to recite all of the relationships that should exist between those charged with teacher-

training and those who are responsible for the supervision of vocational agriculture that may be conducted under the Vocational Education Act. Nor has any attempt been made to cover any one of these relationships in detail. The Vocational Education Act has placed before those interested in the development of vocational agriculture and those interested in the preparation of teachers for this subject a great opportunity. As has been definitely pointed out, the greatest strength will be developed in each of the phases when they are working upon a coordinate basis with the fullest, freest, and frankest exchange of views between the two parties who in the end will be responsible for the failure or success of the work—the one who prepares the teacher and the one who supervises him after he has entered the profession. To accomplish this there must be *conference, conference, conference*.

PART III.

SECTIONAL CONFERENCES AND PERIODS OF PROFESSIONAL IMPROVEMENT WORK FOR TEACHERS OF AGRICULTURE IN HIGH SCHOOLS.

TEACHERS OF AGRICULTURE IN HIGH SCHOOLS.

There are those who think that agriculture ought to be taught in every high school.

COLLEGE PREPARATORY TEACHERS.

A woman teacher in a high school was not content to teach marine biology in an inland city. She sought to correlate her science teaching with gardening. So successful was she in promoting interest in the practical applications of science to gardening, and so strongly was she supported by her school committee, superintendent of schools, and interested citizens, that, it has been stated on good authority, the demand for three or four decker tenement blocks has dropped to such an extent as to discourage further investment in such properties, preference being given to homes in the suburbs with at least a little land about them for tillage. City schools may contribute greatly toward the development of "garden cities."

One need not argue that efforts which promote the tendency toward the garden city are salutary; nor, that correlation of high-school science with whatever in the environment of pupils is agricultural, or can be made so, is commendable. Hand maidens of education, too long neglected and still too little understood, are observation and action, quick and accurate eyes, ready and productive hands.

The aim of high-school agricultural instruction need not be vocational. It may have strong avocational values. It also may have important prevocational, or vocational guidance, values. If it guides pupils into agricultural colleges, it will at the same time be assisting them to accumulate experience which can not but add to the value of their agricultural college training. Many a high-school teacher may reasonably hope to carry correlation of science with things agricultural far enough to enable pupils to claim at least two units of college-entrance credit.

City teachers of science, men or women, whose pupils have access to tillable land may well emulate the example of Miss Annie Burke, of Brockton, Mass., the woman above referred to. Both city and

village teachers, in proportion as their efforts at correlation of high-school science with the growing of agricultural products approach the degree of her success, may properly be looked upon as high-school teachers of agriculture.

Vocational agricultural teachers.

Other high-school teachers may be intrusted with agricultural courses which are vocational. The home-project plan of teaching makes such courses, not only possible, but most desirable in all high schools attended by boys who live on farms. Federal aid under the Vocational Education Act is giving a tremendous impetus to the development of such courses throughout the United States. Such courses, in the cases of boys who desire further education, will doubtless be allowed generous college entrance credit.

The writer should be understood to have high-school teachers of agriculture suited to vocational courses primarily in mind in discussing the subject of this paper.

(a) *Practical teachers.*—The vocational agricultural teacher must be first of all practical. He must know the farm routine of the region in which he teaches. He must be able to do. He must have understanding and sympathy. He must have common sense—the most uncommon of all senses. He must be not only a man among men, but a farmer among farmers. Otherwise he can not hope to command the respect and enlist the cooperation for good home-project work of the fathers of the pupils in his classes, and in the absence of such respect and cooperation his efforts will be futile.

Life-long farm experience is desirable. At least eight years of farm experience, following the twelfth birthday, if he is not an agricultural college graduate; or four years of farm experience plus all long vacations during the four years in college spent in farming, if he is an agricultural college graduate, is the minimum qualification for State or Federal aid in Massachusetts.

(b) *Technical teachers.*—The vocational agricultural teacher must also be able to give instruction in the bearings of the sciences upon the productive farming operations he teaches. His boys must be taught not only to do but also to comprehend. He must promote both action and reflection, both skill and judgment. He must develop not merely farm hands but also farm managers. He may be a self-made man, but can hardly hope for success and approval in the absence of the equivalent of the training in technical agriculture offered by a degree course in an agricultural college. He is fortunate if he has had a four years' agricultural college course.

(c) *Teachers as teachers.*—Finally, the vocational agricultural teacher must be a master of good teaching methods. He must understand both the subject method and the project method, and know

when and where and how to displace the former by the latter. He is fortunate if he has been a student of teaching methods and principles, and has had successful experience in teaching under competent supervision prior to undertaking the exacting duties of the vocational agricultural instructor.

PROFESSIONAL IMPROVEMENT.

There has been one two-teacher high school vocational agricultural department in Massachusetts, and there may be others in future. Generally, throughout the country, high-school teachers of agriculture have been and are likely to be the only specialists in charge of their several one-teacher departments. This but emphasizes the need that they shall be mature men of practical farm experience and of adequate technical agricultural education. May we hope to take a man of such training and experience and develop him into a good teacher?

It is small wonder, perhaps, that when the writer first proposed the home project one-teacher high-school department plan of vocational agricultural education, he was met by a professor of agricultural education with the declaration, "The plan you are proposing is impossible. This is the day of specialization. Even a college professor can hardly hope to master completely the specialty of his department, and you are proposing that the high-school teacher shall be a specialist in all agricultural specialties."

Of course this critic was laboring under a misapprehension. Students of farm management are arguing that the most profitable farm, the country over, is the general farm. What the writer proposed and still advocates is that the agricultural instructor, in a region where general farming ought to be the rule, should know and be able to do the things that agricultural educators are everywhere claiming the general farmer ought himself to know and be able to do. If this program is not impossible for the farmer himself, it should not be impossible for the one-teacher department instructor. And, as a matter of fact, it has been proved over and over again, not in one State, but more recently in several States, not to be an impossible program. In a region of specialty farming the instructors may be specialists, and the plan becomes very easily possible.

Assurance of success was made doubly sure, at the outset, in Massachusetts, by a definite reservation of time every year, in the case of every instructor, for "professional improvement."

IMPROVEMENT IN FARMING.

Every instructor should keep abreast of the best farm practice. If his duties with his boys are so engrossing as to absorb most of his time, during part of the year he may be taken away from his boys

and be put to work with farmers. His work with farmers may be work at one or another branch of farming in which he is not sufficiently proficient. Or, it may be making of farm management surveys. Instructors have made 50 or more of such surveys, and followed them up from year to year, with the advice and cooperation of the farm management specialist of the agricultural college. Their acquaintance with farmers and farming has thus been improved.

IMPROVEMENT IN TEACHING.

Owing to the stress put upon practical farm experience and technical agricultural training, in approval of candidates, men of considerable maturity are generally appointed to high-school agricultural instructorships. Their point of view is essentially the point of view of the adult. They are strongest in their hold upon the older boys in their classes. Such men may need not so much to be taken away from boys to be put with men as to be taken away from men to be put with boys. Accordingly, in certain cases, instructors have been encouraged to give preference in their work in the community, apart from the teaching of boys enrolled in their classes, to supervision of the agricultural club work of the children, and particularly of boys 12 and 13 years of age. There are important aids to efficient club-work supervision, available through the system of Federal and State leadership of club work. From these the instructors have benefited. The younger boys in the vocational classes of 14 or 15, in some cases have the immaturity of mind and body of boys 12 and 13 years of age not yet old enough to be enrolled; and boys of 12 and 13, in many cases, have the maturity of mind and body of those 14 years of age or older. Work with the children and particularly with those just under vocational school age increases familiarity with boys, knowledge of their points of view, and acquaintance with ways and means of interesting and instructing them. "Professional improvement" credit in Massachusetts is therefore given for all supervision of agricultural club work of boys 12 and 13 years of age.

Incidentally, of course, such work with children provides an excellent finding or guiding system. It enables the instructor to single out those boys with special aptitudes for farming, who might well be encouraged to enter the vocational course. The boys in turn have a fair chance to compare the agricultural teacher with other teachers and to try out their own abilities in the agricultural field. Choice of the vocational agricultural course, on the basis of such experience, is likely to be wisely made or made not at all.

Equally important with keeping abreast of farming is it that the instructor shall keep abreast of the development of agricultural

science in its various phases. Part of the year, accordingly, an instructor may be taken away from both boys and farmers, to be put with agricultural college research and extension workers. He thus finds his way to sources of sound information, and returns to his teaching with his stores of knowledge enriched and with his spirit invigorated.

But the need of some instructors is not so much for better skill in farming, better knowledge of young boys, or better command of sources of agricultural information, as it is need for study of teaching as teaching. In certain parts of the year, in such cases, instructors may be taken away from the pressing routine of their jobs in order that they may the better analyze their work in its pedagogical aspects, and make headway in better preparation of teaching materials and devices.

CHOICE OF PERIODS.

From the foregoing it will be evident that "professional improvement" may require periods apart from teaching. Winter periods have generally been selected. Absence of instructors in December, January, or February does not interrupt supervision of projects during the growing season, when such supervision ought in all cases to be continuous. It tends to prevent an overdose of book agriculture for the pupils. Boys who have been hard pressed by heavy project study and project work during the spring, summer, and fall months, sometimes benefit from the half-time vacation from school work which may be allowed during the agricultural instructor's absence. Pressure of outdoor duties sometimes reduces the vitality and the enthusiasm of boys for nonagricultural subjects. They tend to fall behind their classmates in those subjects. Winter absence of the agricultural instructor makes it possible for other teachers to claim more time. Boys who have fallen behind thus make up what they have lost. They even, sometimes, are able to anticipate the work of the spring, and thus get enough ahead of their classes so that the pressure of outdoor work during the spring does not put their standing in nonagricultural subjects in jeopardy. A very desirable device for stopping the gap occasioned by winter absence of an agricultural instructor has been employment of a foreman carpenter to give agricultural pupils farm shop work instruction. Thus in various ways the instructor's winter absence may be freed from awkwardness in school administration.

Periods of "professional improvement" may, however, be concurrent with teaching. Where the number of boys to be supervised during the summer is not so great as to demand all of the time of the instructor, one-quarter—in some cases one-half—his time between the close of formal class instruction in June and the opening of such

instruction in September may be devoted to "professional improvement."

In Massachusetts the first steps in the agricultural teacher-training plan, under the Vocational Education Act, are being taken. A sort of project method of teaching teachers how to teach agriculture, after they have been appointed to their jobs, has been adopted. The teacher trainer goes from school to school and from man to man. He helps each instructor on the spot. Winter absence for "professional improvement" may be reduced, in some cases it may be omitted, if the State supervisor finds that the teacher trainer has been able to stimulate and guide the instructor sufficiently along the path of improvement in teaching while teaching. The project plan of teacher training, however, provides for seminar courses during part of the winter and part of the summer, at the agricultural college, to be conducted by the agricultural teacher trainer. Instructors who are unable to make sufficient improvement in their teaching, while teaching, will do part of their "professional improvement" work in those seminar courses.

No man is too old to learn. By the same token no man is considered in Massachusetts too old to improve in his farming and in his teaching. Professional improvement from the beginning has been a fundamental feature of the Massachusetts Plan of Vocational Agricultural Education. A maximum of two months a year has been, and still may be, required. During this time the instructor is on salary. His program of improvement may be proposed by himself, by the local school authorities, by the agricultural teacher trainer, or by the State supervisor. It is subject to the State supervisor's approval. The work is done primarily for the good of the service. Men who began teaching in Massachusetts and who have greatly improved during service, are still in the service, though not always at the places where their work began. Since the State pays two-thirds of the salaries of agricultural instructors, it is perhaps fair that part of the return from the "professional improvement" investment should be distributed over more than one locality, as is the case where instructors find promotion or are transferred from position to position within the State.

The minimum requirement of professional improvement is two weeks a year. Every instructor in the agricultural education service must attend a winter conference and a summer conference of about one week each. Attendance at these conferences is credited to each man as "professional improvement" work.

SECTIONAL CONFERENCES.

There are advantages to be gained from holding conferences of groups of instructors at different points in the State. In the larger

States, with varied agricultural conditions and long distances of travel, sectional conferences are particularly important. Massachusetts, though but the size of a postage stamp on the big map of the country, is still large enough to make sectional conferences desirable. So far the second sectional conference was held last summer. It was described by Prof. Hall-Quest, who participated in the conference by introducing and leading the discussions of "Supervised study," as a "conference on wheels." The conference opened in the northeastern county of Essex, visited schools and departments in high schools from northeast to southeast, and terminated on Cape Cod. The conference this summer was held with headquarters at the Massachusetts Agricultural College, Amherst, and covered visits to schools and departments in the west-central part of the State.

The writer may have been invited to treat this subject because of this itinerant innovation. He feels that best headway is made at conferences of teachers, as in the teaching of agriculture itself, by immediate contact with jobs. Men on the program scheduled to discuss one or another phase of their equipment, methods, or results do their talking at home and not at a distance. Those present see that what these instructors state they are doing they actually are doing. Most men see better than they visualize. We have no instructors in Massachusetts, of course, who would be inclined to exaggerate. It will be evident, however, that there can be no bluffing at an itinerant conference, where a man's equipment, methods, and results speak for themselves. Men who would not bluff if they could have a very great advantage in discussing their work, if, in connection with their discussion, opportunity is given them to demonstrate with their own devices and to be measured by their own achievements and those of their boys. The speaker feels that the "conference on wheels" can not be too strongly commended.

Of fundamental importance also, the writer feels, are joint conferences of vocational agricultural directors and instructors, agricultural college, research, and extension men, and agricultural county agents. For the past six years such joint conferences have been held in winter at the Massachusetts Agricultural College. The most favorable time has been the week before Christmas. At these conferences, policies to govern vocational instruction and extension work during the succeeding year have been agreed upon. Unity of aim, consistency in methods, and division of labor have thus been possible. Just as the instructor returns to his post from a summer conference with a better background of knowledge of agricultural conditions in Massachusetts and of teaching methods, so he returns to his post from a joint conference with a better sense of the agricultural education and extension movement of the country and the State. If he is a newcomer the winter conference enables him to make the acquaintance

of specialists upon whom he may call in emergencies throughout the year. Some of the strongest men in agricultural education and extension work in the country are always invited to be present. From them the instructor gains inspiration. In his work he feels that he is a torchbearer for the best the country and the State have to offer his locality. Such conferences tend to prevent "overlapping" and "overlooking." They minister to economy and efficiency. The conference should not be looked upon as something apart from "professional improvement," but as features of fundamental importance in "professional improvement."

In conclusion, the writer feels that "professional improvement" has been a challenge, which year by year has tended to bring out the finest qualities of the instructors. No man has done "professional-improvement" work without sacrifice. Something has been laid on the altar by each man, but willingly laid. The needs of individual localities and instructors are better and better met. The conferences contribute unity of spirit and aim. They are of fundamental importance. In other phases of "professional improvement" the instructor may feel that he is working more or less as a unit, and principally for his own good or the good of his particular field of service. At the conferences he feels himself swung into the great forward movement, feels himself falling into step with the great host of workers for agricultural betterment. He returns to his post stronger in his own strength, but stronger by far in the united strength of the men he has met and now feels himself shoulder to shoulder with in an unconquerable advance.

PUBLICATIONS OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

Annual Report.

The Vocational Summary, published monthly by the Federal Board for Vocational Education (vol. 1, No. 1, May, 1918).

Bulletin No. 1. Statement of Policies.

- * Bulletin No. 2. Training Conscripted Men for Service as Radio and Buzzer Operators in the United States Army (International Code).

Bulletin No. 3. Emergency Training in Shipbuilding—Evening and Part-Time Classes for Shipyard Workers.

- * Bulletin No. 4. Mechanical and Technical Training for Conscripted Men (Air Division, U. S. Signal Corps).

Bulletin No. 5 (Reeducation Series No. 1). Vocational Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 166.)

Bulletin No. 6 (Reeducation Series No. 2). Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 167.)

- * Bulletin No. 7. Emergency War Training for Motor-Truck Drivers and Chauffeurs.
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- Bulletin No. 13 (Agricultural Series No. 1). Agricultural Education—Organization and Administration.
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- Bulletin No. 21 (Agricultural Series No. 3). The Home Project as a Phase of Vocational Agricultural Education.
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- Bulletin No. 25 (Reeducation Series No. 4). Ward Occupations.
- Bulletin No. 26 (Agricultural Series No. 4). Agricultural Education—Some Problems in State Supervision.

All communications should be addressed to

The Federal Board for Vocational Education, Washington, D. C.

* Emergency war training for conscripted and enlisted men.

BULLETIN No. 27

**AGRICULTURAL SERIES
No. 5**

THE TRAINING OF TEACHERS OF VOCATIONAL AGRICULTURE

**ISSUED BY THE
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FOREWORD.

By the provisions of the vocational education act of 1917, the Federal Board for Vocational Education is charged with the duty of disbursing Federal moneys to the States for approved instruction in agriculture of less than college grade and for approved teacher-training work in agriculture. It is also charged with the duty of causing to have made studies, investigations and reports with particular reference to their use in aiding the States in giving such instruction.

This study was prepared by W. G. Hummel, Assistant Director for Agricultural Education, and is published by the Board in order to indicate the importance of adequate training for prospective vocational agriculture teachers and to outline the qualifications and training which seem desirable for them.

An efficient system of training vocational agriculture teachers for work in schools of the type described in the vocational education act is indispensable to the success of the State plans for the promotion and establishment of vocational agricultural education under the provisions of the act. The quality of the teaching is the pivotal fact in vocational, as in any other system of schooling. Poor teaching can not be compensated for by anything else. But a uniformly high order of efficiency in teaching can exist only as a result of adequate teacher training. Such training is of especial importance in the case of the vocational teacher because of the special demands of the type of work done by him. Though the training of vocational teachers has much in common with that of other secondary teachers, it is more complex.

This bulletin discusses the kind and extent of training needed by the teacher of vocational agriculture, the special facilities and conditions needed in order to carry on such training successfully, and the place of an effective agricultural teacher-training system in the scheme of vocational agricultural education contemplated and intended to be promoted by the vocational education act. It is hoped that it may prove suggestive to persons interested in the administration of the act and of definite aid to all persons directly or indirectly engaged in the preparation of teachers of vocational agriculture.

C. A. PROSSER,
Director.

THE TRAINING OF TEACHERS OF VOCATIONAL AGRICULTURE.

INTRODUCTION.

THE DEMAND FOR VOCATIONAL TEACHERS.

Two factors are creating a greatly increased demand for secondary teachers of agriculture, home economics, and trades and industries: (1) The great interest in vocational education in high schools within recent years, due to the evident need and insistent demand for such instruction; and (2) the increased interest in and development of vocational education in high schools which is resulting from the passage of the act providing Federal aid for vocational education in schools below college grade.

In order to supply the demand, the capacity of existing agencies for the training of vocational teachers must be expanded or new agencies created. A continuous, adequate supply of properly trained vocational teachers is imperative for the success of the well formulated programs of vocational education which the passage of the Smith-Hughes Act insures ultimately in every State.

Standards for vocational teacher-training work should be improved. Future teachers of vocational subjects must have more extended and specialized training for their work than has been usual in the past if they are to meet successfully the rising standards set for secondary vocational work.

PURPOSE OF THIS BULLETIN.

The present bulletin is an attempt both to indicate the importance of adequate training for prospective vocational teachers and to outline briefly the qualifications and training which seem desirable for teachers of vocational agriculture. It is hoped that it may prove suggestive to State Boards of Vocational Education, State Directors of Vocational Education, State Supervisors of Agricultural Education and all persons directly or indirectly engaged in the preparation of teachers of vocational agriculture.

IMPORTANCE OF GOOD TEACHING.

Without question, the teacher problem is the big problem in secondary vocational instruction to-day. We may have effective organi-

zation and wise administration of our vocational instruction, suitable material equipment and a logical course of study based on scientific principles, but no one or all of these will appreciably raise our standard of vocational education unless we have better vocational teaching. The quality of the teaching is the pivotal fact in the vocational, as in any other, system of schooling. Organization, administration, equipment, and the course of study are but means to the end that the individual teacher may be brought into intimate personal touch with the individual pupil, that he may reveal and interpret to the pupil in a vitalized, stimulating way what the course of study represents and, especially in the case of vocational subjects, that he may guide him in the utilization of that knowledge.

RESULTS OF POOR TEACHING.

Poor teaching can not be compensated for by anything else. The welfare of the individual pupils of a school depends to a far greater degree upon the quality of instruction than upon any other one thing. Distinction is imparted to a school by a high order of efficiency in teaching, rather than by the nature of the course of study. Bad teaching defeats the ends for which the school exists and wastes time, money, and effort.

NECESSITY FOR TRAINING VOCATIONAL TEACHERS.

Thorough training is of especial importance for the secondary vocational teacher because of the special demands of the type of work done by him. In order to be successful, vocational teaching must result in a degree of ability to do, as well as in knowledge on the part of the pupil. The vocational teacher must have some skill in the practice of his vocation, in addition to knowing the principles on which it is based and in accordance with which it is carried on.

There is little doubt that the chief reason for the lack of success of agriculture in schools where it has not been as successful as it was hoped it would be has been the want of completely equipped and thoroughly trained teachers of agriculture. Not infrequently a man with thorough technical knowledge of agriculture has failed in his teaching work because of a lack of knowledge of the practice of agriculture or of teaching methods. On the other hand, the pedagogically trained man, with inadequate agricultural information, has been found lacking because of his shallow knowledge of his subject. Again, the practical farmer fails because of his lack of knowledge of technical agriculture and teaching methods.

It is evident, from the nature of the work of secondary vocational teachers, that though their training has much in common with that

of other secondary teachers, it is more complex. Special facilities and equipment are necessary in order to carry it on successfully. Persons in charge of the training of vocational agriculture teachers must have a special preparation and viewpoint. Federal and State aid is practically necessary for its satisfactory development in an institution.

FEDERAL AID FOR TRAINING VOCATIONAL TEACHERS.

Practically the first stimulus to the training of agricultural teachers was given by the Nelson amendment to the Agricultural appropriation bill approved March 4, 1907. This increased the Federal appropriation for the support of land-grant colleges and provides that "said colleges may use a portion of this money for providing courses for the special preparation of instructors for teaching the elements of agriculture and the mechanic arts."

FUNDS APPROPRIATED.

More complete recognition of the need for trained agricultural teachers is shown in the vocational education bill known as Smith-Hughes Act, which was approved by the President February 23, 1917. Section 4 of this act appropriates funds to be used by the States in cooperation with the Government for the maintenance of training courses for prospective teachers, supervisors, and directors of agricultural subjects and teachers of trade, industrial, and home economics subjects. These teacher-training funds, allotted to the States on the basis of total population, increase from an appropriation of \$546,000 in 1917-18 to a maximum of \$1,090,000 in 1920-21, the latter sum being the annual appropriation thereafter. (See table of grants, p. 10.) Since every dollar of the Federal money appropriated is furnished upon condition that it be matched by an equal amount appropriated for the same purpose by the State or local community or both, it is obvious that the total amount of money available for teacher-training purposes will be double the amount shown in the table of grants.

In addition to appropriating funds for the training of teachers, supervisors, and directors of agricultural subjects, the Smith-Hughes Act provides for cooperation between the Federal Government and the States in the establishment and support of approved instruction in agriculture of secondary grade. Funds are appropriated for salaries of teachers, supervisors, and directors of agricultural subjects, totaling \$548,000 in 1917-18 and increasing yearly to a maximum of \$3,027,000 in 1925-26. This latter is the annual appropriation thereafter.

**Annual grants by the Federal Government for vocational education under the
Smith-Hughes Act approved Feb. 23, 1917.**

Fiscal year ending June 30—	Total.	Agriculture: For salaries of teachers, supervisors, and directors.		
		Total.	Allotted on basis of rural population.	Additional to provide minimum allotments to States.
1917-18.....	\$1,800,000	\$543,000	1 0	\$48,000
1918-19.....	2,512,000	784,000	1 0	34,000
1919-20.....	3,182,000	1,024,000	1, 0	34,000
1920-21.....	3,836,000	1,268,000	1, 0	18,000
1921-22.....	4,329,000	1,514,000	1, 0	14,000
1922-23.....	4,823,000	1,761,000	1, 0	11,000
1923-24.....	5,318,000	2,009,000	2, 0	9,000
1924-25.....	5,390,000	2,294,000	2, 0	24,000
1925-26.....	7,367,000	3,027,000	3, 0	27,000
Annually thereafter.....	7,367,000	3,027,000	3, 0	27,000

Fiscal year ending June 30—	Trade, home economics, and in- dustry: For salaries of teachers.			Teacher training: For salaries of teachers and maintenance of teacher training.			For Federal Board for Voca- tional Educa- tion.
	Total.	Allotted on basis of urban population.	Addi- tional to provide minimum allot- ments to States.	Total	Allotted on basis of total population.	Addi- tional to provide minimum allot- ments to States.	
1917-18.....	\$566,000	\$500,000	\$66,000	1 00	1 00	\$46,000	\$200,000
1918-19.....	796,000	750,000	46,000	00	00	33,000	200,000
1919-20.....	1,034,000	1,000,000	34,000	00	00	24,000	200,000
1920-21.....	1,278,000	1,260,000	18,000	1, 00	1, 00	90,000	200,000
1921-22.....	1,525,000	1,500,000	25,000	1, 00	1, 00	90,000	200,000
1922-23.....	1,772,000	1,750,000	22,000	1, 00	1, 00	90,000	200,000
1923-24.....	2,019,000	2,000,000	19,000	1, 00	1, 00	90,000	200,000
1924-25.....	2,556,000	2,500,000	56,000	1, 00	1, 00	90,000	200,000
1925-26.....	3,050,000	3,000,000	50,000	1, 00	1, 00	90,000	200,000
Annually therea. ter....	3,050,000	3,000,000	50,000	1, 00	1, 00	90,000	200,000

HOW FUNDS MAY BE SECURED BY STATES AND INSTITUTIONS.

In order to secure the benefits of the appropriations, the State Board for Vocational Education must prepare and submit to the Federal Board for Vocational Education for approval a plan showing, first, the scheme for the administration of the act in that particular State; second, the acceptance of the act in that particular State; and third, the full description of the forms of vocational work to be undertaken. With regard to teacher training, it is provided in the act that the State board of any State "shall provide in its plan for such training that the same shall be carried out under the supervision of the State board, that such training shall be given in schools or classes under public supervision or control, that such training shall be given only to persons who have had adequate vocational experience or contact in the line of work for which they are preparing themselves as teachers, supervisors, or directors, or who are

acquiring such experience or contact as a part of their training; and that the State board, with the approval of the Federal Board, shall establish minimum requirements for such experience or contact for teachers, supervisors, or directors of agricultural subjects and for teachers of trade, industrial, and home economics subjects; that not more than 60 per cent nor less than 20 per cent of the money appropriated under this act for the training of teachers of vocational subjects to any State for any year shall be expended for any one of the following purposes: For the preparation of teachers, supervisors, or directors of agricultural subjects, or the preparation of teachers of trade and industrial subjects, or the preparation of teachers of home economics subjects." Moreover, a further provision of the act requires that after June 30, 1920, it will be necessary to establish teacher training for agriculture in order to use any Federal moneys for agricultural education, teacher training for home economics in order to use any Federal moneys for home economics education, and teacher training for trades and industries in order to use any Federal moneys for trade and industrial education.

KIND OF SCHOOLS IN WHICH VOCATIONAL TEACHERS WILL SERVE.

These appropriations of the Smith-Hughes Act for the promotion of secondary vocational agriculture instruction and for the training of teachers of vocational agriculture insure the development of a nation-wide system of agricultural education in schools of less than college grade. The majority of future teachers of secondary agriculture will teach in schools receiving money under the provisions of the act. It is obvious, therefore, that their training should be such that it prepares them to carry on efficiently the type of agricultural instruction to be fostered in these secondary schools.

The act makes clear the fact that this secondary instruction must be distinctly vocational and designed to fit for useful employment in agricultural work. Certain standards must be set up by the State board and approved by the Federal Board for schools which are to receive the benefits of the appropriations. These standards include the qualifications of teachers, minimum amount for maintenance, the minimum plant and equipment and courses of study. Under the terms of the act the instruction must include at least six months of supervised practical work.

Any plan for the training of secondary teachers of vocational agriculture must, then, take into account the fact that these teachers are to be prepared for distinctly vocational teaching in schools of the secondary type; and that rising standards as to the work done

in these schools and as to the qualifications of vocational teachers are inevitable as the result of the plan of cooperation between the Federal and State Boards.

QUALIFICATIONS AND TRAINING DESIRABLE FOR SECONDARY AGRICULTURE TEACHERS.

As a preliminary to discussion of a suitable course of study for prospective vocational agriculture teachers, a general review of the qualifications and training desirable for them is advisable.

To begin with, the secondary agriculture teacher should possess a personality which will aid and not handicap him in his work.

His training should include the acquisition of—

(a) Sound and extended knowledge of agriculture, both technical and practical, and, since agriculture is an art as well as a science, some skill in agricultural operations;

(b) The professional knowledge and skill special to the work of teaching agricultural subjects in secondary schools; and

(c) Enough extra training in various sciences and humanities to give a wide outlook and an appreciation of the relation of agriculture to other subjects and to society.

The personal qualities desirable for the agricultural teacher are, in general, those which any worker who deals primarily with people must have in order to succeed. Among them are open-mindedness, frankness, honesty, common sense, tact, optimism, an enthusiasm for agriculture, a willingness to work hard, and a genuine interest in the welfare and success of others.

The teacher of agriculture should be a man who will command the respect of farmers of the community because he possesses qualities of leadership as well as because of his training in the science of agriculture and his experience in farming. He should be a man who will command the respect of the nonagricultural population of the community because of openmindedness and qualities of sound, progressive and active citizenship, as well as because of ability in his work. He should be a man who will command the respect of his fellow teachers because of professional skill and ability to cooperate for the common good as well as because of his thorough knowledge of his subject.

Personality is usually looked upon as a personal gift, in which one happens to be fortunate or unfortunate, but which is fastened upon one for life. Some persons are naturally more fortunate than others in possessing a "ready-made" personality which will help them in vocational teaching work. Yet many handicaps in personality can be overcome with a little effort and it has often been dem-

onstrated that many of the qualities which are considered as contributory to "good personality" in a teacher can be developed or greatly modified by professional training.

NECESSITY OF QUALIFICATIONS OUTLINED.

The necessity for the kind of training outlined for the vocational agriculture teacher seems obvious, but we review below a few reasons for it.

The vocational agriculture teacher must have an extended training in agriculture because the agricultural field is so broad and includes so many subjects that an extended training is necessary in order to see it as a whole and to gain a comprehensive, adequate knowledge of the theory and principles on which agriculture is based. A little knowledge is truly dangerous for the agricultural teacher. He can not expect success if he is in constant danger of finding himself upon the edge of his mental possessions.

This agricultural knowledge must be two-fold, consisting of so-called technical agriculture, and practical agriculture and farm experience.

A knowledge of the theory and principles on which agriculture is based is necessary for an understanding of practical agriculture and for the working out of agricultural problems.

A knowledge of practical agriculture is necessary in order to acquire good "agricultural judgment"—ability to weigh the applicability and utility of agricultural theories and practices under varying conditions. Through a knowledge of practical agriculture, the oneness of the science of agriculture with the art of agriculture becomes apparent.

Practical farm experience, including farm management experience, is necessary for the agricultural teacher that he may acquire skill in farm operations, i. e., that he may become capable of applying his knowledge with as close an approach as possible to the desired results.

In addition to thorough agricultural training, the vocational agriculture teacher must have professional training, i. e., professional preparation for the actual work of instruction and a professional attitude toward the work of the secondary school.

Mere knowledge of his subject does not prepare one to teach. The good student is not always a good teacher. Scholarship and teaching ability do not necessarily go hand in hand. A man may know theoretical and practical agriculture and have considerable skill in farm operations and yet fail as a teacher of agriculture.

In order to do successful work the teacher needs to know the principles which govern the processes of learning and teaching and on

which teaching methods are based. The vocational agriculture teacher must be able to overhaul his knowledge from the teacher's point of view and to know the relative importance of the various phases of his knowledge for use in secondary instruction. In other words, he must know how to teach his subject in such a way as to make it of most benefit to the pupil. This means that his professional training must be of two types—theoretical and practical. The aim of the theoretical training is, of course, to give professional knowledge. The aim of the practical training is to give professional judgment and skill.

The professional training of the vocational teacher must be both general and special; general that he may understand the processes of all education, and special that he may have a thorough knowledge of methods of carrying on successfully vocational education of the particular type in which he is interested. It must include both the observation and practice of vocational teaching of the type which the prospective teacher expects to undertake.

However far we may advance in scientific knowledge concerning the teaching process, we shall never be able to substitute the science of education for the art of teaching, any more than a mere theoretical knowledge of technical agriculture can be a successful substitute for a knowledge of the practical arts of agriculture. The acquisition of skill in the art of teaching involves ability on the part of a student to use the teaching practices of a successful teacher. This demands both the observation and practice of teaching.

The statement that "teachers are born, not made," is a fallacy. Native ability is an asset in teaching, but, as a rule, the successful teacher is a "made" teacher. It is possible to impart the qualifications of a good teacher to a much greater degree than is commonly believed. There are, of course, persons who could never be made good teachers. One of the functions of teacher-training departments should be to discover and weed out those unfit for teaching.

The vocational agriculture teacher needs a liberal extra professional and agricultural training in the sciences that he may be able to trace the roots of agricultural theory and practice in chemistry, physics, biology, geology, economics, entomology, bacteriology, and other sciences, and to see their relations one to the other. He should be sufficiently acquainted with them to understand and be able to utilize their values for agriculture.

In the humanities, the vocational agriculture teacher needs such training as will give him a certain degree of general culture and "all-aroundness," and enable him to use to the best advantage the agricultural and professional training which has formed his major work.

This work should prevent him from seeing things small. It should give him an appreciation of the educational value of other studies and keep him from magnifying his specialty out of proportion in its relation to life. It should give him an appreciation of his duty to the State and to society, as a citizen, as an agriculturist and as a teacher. It should assist him in obtaining adequate recognition and respect for himself and his subject in the community in which he works.

Assuming agreement as to the needs of these forms of training for the vocational agriculture teacher, we are next confronted by such questions as:

“How long a time is required for this thorough training?”

“What proportion of the time of the training period is it desirable to devote to the different phases of training?”

“What subjects or courses may best be selected for study in order to give adequate training along each major line?”

“What should be the content of these courses?”

LENGTH OF COURSE DESIRABLE FOR AGRICULTURAL TEACHERS.

Graduation from a four-year college course in agriculture, accompanied by practical farm experience and followed by a year of graduate work, is the ultimate standard to be desired. Graduation from a four-year college course in agriculture in which suitable provision is made for agriculture, science, humanistic and professional studies and training should be the standard accepted at the present time. The minimum training which should be required from a candidate for a position as teacher of vocational agriculture in a high school, even during the present time of inadequate supply of trained teachers, should be practical experience, at least two years of college instruction in agricultural subjects and some degree of professional training. This minimum should be considered and accepted only as a temporary expedient.

APPROXIMATE DIVISION OF TIME OF PROSPECTIVE AGRICULTURAL TEACHERS DURING TRAINING.

For purposes of discussion we have outlined an approximation of the division of time of prospective vocational agriculture teachers during a four and a five year course. Practical farm experience, though required, is not here indicated.

Agricultural studies.		Sciences.		Humanistic studies.		Professional work.	
4-year course, 38 per cent.	5-year course, 36 per cent.	4-year course, 28 per cent.	5-year course, 24 per cent.	4-year course, 20 per cent.	5-year course, 23 per cent.	4-year course, 14 per cent.	5-year course, 17 per cent.
(Includes both general and special courses.) Field and forage crops. Soils and fertilizers. Animal husbandry. Dairying. Poultry husbandry. Horticulture. Vegetable gardening. Farm mechanics. Farm management.		(Both courses in pure and applied sciences.) Chemistry. Physics. Biology (botany, zoology). Geology. Agricultural chemistry. Economic entomology. Plant pathology. Veterinary science. Plant breeding. Bacteriology.		English. History: American. General. American government and citizenship. Agricultural economics. Rural sociology. History of the development of agriculture. Rural organization. Agricultural literature; its kinds, sources, utilization, and care.		Educational psychology. Principles and general methods of education. Development of American educational system (emphasis on secondary and vocational education). Special methods in agricultural teaching. Observation and practice teaching. School administration (in 5-year course only). Seminar (in 5-year course only).	

In both the four and five year course of training, the first two years will be devoted almost entirely to agriculture and related science studies. Probably no professional work will be given during this period and the humanistic studies will be confined to English and possibly history, American government and citizenship, and agricultural literature. Professional studies will naturally be distributed over the junior and senior year of the four-year course and over the third, fourth and fifth years of the five-year course.

In a four-year course, possibly not all of the humanistic courses noted can be given, but none of them should be omitted from a five-year course. The five-year course permits additional specialization in professional studies and in some preferred agricultural subject. It also gives opportunity for further studies in the humanities. That training along these lines is a distinct asset and its lack a handicap is not doubted by persons who have watched the work of agricultural teachers in any considerable number of communities.

NECESSITY FOR AND CHARACTER OF PRACTICAL FARM EXPERIENCE INCLUDED IN THE TRAINING OF THE PROSPECTIVE TEACHER OF VOCATIONAL AGRICULTURE.

In addition to work similar to that outlined above, practical farm experience must be required for vocational agriculture teachers. In high school departments of agriculture, there is commonly but one teacher of agriculture. He is the instructor in both farm work and in the agricultural science taught in the classroom. This necessitates practical farm experience and a knowledge of practical agriculture as a part of his training.

The exact character of the practical farm experience and the length of time which should be given to it is difficult to state as it is

influenced by various factors. Perhaps more than any other phase of a student's training, the needed practical farm experience is influenced by pre-college experience, by personal adaptability, etc.

However, we can state fairly definitely the results for the prospective teacher which should come from farm experience. This will help us to determine, both in a general way and for individuals, the character of the practical experience needed and the time which should be devoted to it.

The teacher-training aim of the required farm experience is twofold:

(a) To give to the teacher a certain degree of judgment and skill in the vocation which he is to teach; and

(b) To weave into his knowledge of agriculture a sympathetic, unacademic rural viewpoint.

It implies both knowing how to plow and the ability to decide when to plow; knowing when to spread manure, as well as how to drive the manure spreader; knowing how to readjust a worn machine, as well as how to set up a new one; good judgment as to whether to raise crops for human or for animal consumption—whether to keep live stock or to sell surplus feed. In other words, it should result in ability to answer practical farm questions in the light of practical farm experience.

In addition, the teacher should so know and be in sympathy with farm life, through practical experience, that he can mentally put himself in the place of farmers of the community and of the pupils he is teaching, and see things from their viewpoint.

As an approximation, we may state that the secondary vocational agriculture teacher should have, as a part of his equipment, two years of successful experience in farming, gained largely after he has reached the period in life where he can approximate the work of a man on a farm. A boy who has been reared on a farm and taken part in the business of farming as practiced at home and graduated from a college course of instruction in agriculture should meet this qualification. Yet a farm-reared man may fail to possess the desired training and viewpoint as a result of his experience. On the other hand, some town-reared boys may acquire it most satisfactorily during two years of practical farm experience. As indicated in Federal Board for Vocational Education Bulletin No. 13, since the Smith-Hughes Act requires that institutions training teachers of agriculture under the provisions of that act shall give training to persons who have already secured adequate vocational experience or contact in the line of work for which they are preparing themselves as teachers, or who are acquiring that experience or contact as a part of their training, it would seem that the institution should

require at least a considerable part of this practical experience for entrance. The instruction at the institution could then be based upon a background of agricultural experience. However, in addition to the practical farm experience required for entrance, a certain amount of farm practice should be gained under guidance during the period when the student is securing his technical and professional training. It will probably, as a rule, be most convenient and satisfactory to arrange to carry on practice work during summer vacations, but in some cases it may be partly arranged for the college year.

A part of this practical farm work may, if desired, be in the form of definite projects, as in poultry raising, fruit growing, or dairying. This will be of especial value to the prospective teacher since he will later use the project method to such an extent in his teaching work. Farm practice work should also include experience in fundamental farm operations, especially those which may have been neglected during the student's pre-college farm experience.

In any case, the farm practice work carried on as a part of the teacher-training course should be as carefully planned as laboratory work, and with the individual student, his previous farm experience and his practical experience in connection with agricultural courses taken in college, kept constantly in mind. The student completing the work should possess a wide range of experience in farm arts. It will be of advantage to him if he has also initiated and carried to completion various practical farm projects.

CHARACTER AND CONTENT OF TECHNICAL AGRICULTURAL COURSES FOR PROSPECTIVE SECONDARY TEACHERS.

In selecting the agricultural subjects to be included in a college course for the prospective agricultural teacher, it must be remembered that what he needs is a broad general preparation. He needs to gather from the vast body of agricultural materials such parts as will form a desirable, well-rounded equipment. He does not want to be a specialist in some one field of agriculture. In fact, more than one man who has graduated from a good agricultural college has been so one-sided in his agricultural preparations as to be unable to teach the broad course in the high school.

It is not as easy to secure this well-rounded agricultural knowledge from the college course as might be supposed. In too many colleges, the work of departments is so highly specialized that, in order to get a general view of any given subject, as for example animal husbandry, the student is obliged to take many separate courses, as on the horse, sheep, swine, etc. There should be in every agricultural

department one well-rounded general or fundamental course for those who want this type of information.

In addition to broad general preparation in technical agriculture, it is very desirable that the man who goes out into the secondary school to teach should have a fairly thorough knowledge of some one department of agricultural knowledge.

The selection of one or two suitable courses, in as many departments or agricultural subjects as the limitations of time and schedules will permit will give broad general agricultural training. The selection of some one department of agricultural knowledge for intensive study will counteract any tendency toward superficiality. Through the study of the fundamental courses, the student obtains introductory knowledge over a wide range. Through the study of as many courses as can be arranged for in some one agricultural department, he gains a feeling of mastery and the courage of assurance of agricultural knowledge.

As it has been well said: "These two feelings, mastery and assurance, as by-products of his studies, will enable the teacher to capitalize all his equipment to better advantage."

CHARACTER OF SCIENCE SUBJECTS FOR PROSPECTIVE AGRICULTURAL TEACHERS.

In the selection of the science subjects for the prospective agriculture teacher, the guiding aim should be to give him a general view of the field of science and to familiarize him with agricultural applications of the sciences. Introductory courses in the pure sciences, as chemistry, physics, botany, geology, etc., will give him this general view. Courses in agricultural chemistry, economic entomology, plant breeding, plant pathology, etc., will familiarize him with and give him appreciation of the utility of the sciences to the agriculturist.

CHARACTER AND CONTENT OF HUMANISTIC STUDIES TO BE INCLUDED IN THE TRAINING OF THE AGRICULTURAL TEACHER.

When we come to the selection of the humanistic studies to be included in the training of the agricultural teacher, we find the possibilities greatly limited by the amount of time available. Courses in rural economics, rural sociology, rural agencies or organizations, English, history and political economy or government, are imperative.

The agricultural teacher needs sufficient training in English to enable him to express himself in writing or speech with clearness and ease. He needs sufficient acquaintanceship with the subjects of his-

tory and government to meet the demands of general culture and to give him a thorough knowledge of the kinds of national government and appreciation of the duties and privileges of citizenship. He needs knowledge of agricultural economics, rural sociology and rural organizations that he may realize the rights and duties of the agriculturist in his relations to society and that he may form and work toward the attainment of high agricultural ideals.

Another course which should be classed among those which are imperative is one which, for want of a better name, we have called "Agricultural literature." A course presenting similar materials is sometimes given as "Library science."

Too often agricultural college graduates know little of agricultural literature, except as they have come in contact with it during their college course. They are, very often, unfamiliar with many of the kinds and sources of agricultural literature. Many of them do not know how to make sure that their agricultural information on a given topic is up-to-date, or the most reliable to be obtained. And, finally, the majority of them do not know how to keep a collection of agricultural books, bulletins, and other literature in such shape that it will be of the greatest possible use to themselves and to others who may wish to consult it.

The course we have called "agricultural literature" should give, as an introduction, general instruction as to the contents and use of libraries; the use of catalogues and indexes; standard reference books, encyclopedias, dictionaries, etc., and the special merits of each; guides to periodical literature and Government publications. It should include as its main features:

1. A review of the sources and kinds of agricultural publications, including reference books, textbooks, Government publications, periodicals, and nontechnical popular agricultural literature.

2. Information as to how to keep in touch with current agricultural publications, whether in books, bulletins, or periodicals.

3. Elementary instruction in the use of books and enough of their classification, cataloguing, labeling and repairing to be able to take care of a personal collection or direct the care of a school collection of agricultural publications in such a way as to make it most useful.

It is desirable that the student get from this course training in quickly "culling" a book in order to get the points needed or to judge of its usefulness for different purposes. Training in how to study references when found and how to take notes intelligently may also be a legitimate feature of the work.

After a student, whether in high school or college, gets out of school he has no instructor at hand to tell him what books to look

in for information on a given topic. He should know books as tools—where to get them and how to use them.

A teacher to-day can not properly organize his courses of instruction unless he knows the literature of his subject, the resources of the school library, and the mode of using these as an auxiliary in his work.

More and more the lecture and textbook are coming to serve merely to open up a subject, to show its organization, and to disclose its vistas. Library readings are expected to furnish the bulk of the detail that gives significance to the facts or principles of the textbook or introductory lecture.

In addition to the courses mentioned, the prospective agricultural teacher should choose from the humanistic group such other studies as time and the exigencies of his course will permit, which tend to give him general culture or which promise to increase his general competence, usefulness, and standing as a teacher and as a citizen.

CHARACTER AND CONTENT OF PROFESSIONAL TRAINING FOR PROSPECTIVE VOCATIONAL AGRICULTURE TEACHERS.

In the professional preparation of the agricultural teacher, the demands of whose technical training are so great, we should take special care to insure that every course included is a needed course, a practical course, and one which will result in better teaching when the student goes out to the secondary school. We should inquire what the teacher needs to know, from a professional viewpoint, and give him a good understanding of it, but without waste of time and effort. His training should be of such a character that he will be able to realize upon it soon after getting into the classroom.

Looking at the matter from this viewpoint, the following seem reasonable requirements:

I. Theoretical training:

1. Educational psychology.
2. General principles of education.
3. Development of the American educational system (Emphasis on secondary and vocational education).
4. Special methods in agricultural teaching.

II. Practical training:

1. Observation of good teaching and study of its methods under guidance.
2. Practice teaching.

As to the content of the work, the fact that it should be practical should be again emphasized. The selection of materials included in professional courses and the method of presenting these materials should be influenced by this consideration. Theory should stand the test of practical value to the teacher, either in better understanding or better doing of his chosen work.

CHARACTER AND CONTENT OF THEORETICAL PROFESSIONAL TRAINING.

THE PSYCHOLOGY COURSE.

The psychology course for prospective vocational agriculture teachers should be distinctly educational psychology, consisting of any deductions or suggestions helpful to a teacher which can be drawn from the main stream of psychology. Much of the psychology taught in college is no more directly serviceable to a teacher than a fifth wheel to a coach, yet psychology has much to offer which should be of value to every teacher. However, if the prospective teacher is to get these values from a single brief course, the work given must be especially adapted to his needs.

Probably much of the failure of psychology to function in the work of the teacher is due to failure on the part of teacher-training institutions and departments to come to a practical, definite agreement as to the purpose, materials and methods most desirable for adoption in a psychology course for prospective teachers. In the past, the educational value of psychology courses for prospective teachers has depended largely upon the point of view of the individual instructor. In many cases the psychology course for teachers is a course in general psychology, with little or no reference to extra-psychological interests, and apparently having the single purpose of giving insight into psychological principles and theories.

A psychology course for teachers should lay stress upon the applications of psychology, rather than upon its cultural value. Just as agricultural instruction for the future farmer should emphasize the applications of agricultural theory and principles to farming problems, so instruction in psychology for teachers should emphasize the applications of psychological theory and principles to teaching problems.

There is perhaps no one textbook which is thoroughly satisfactory for such a course. There is, however, a wealth of suggestion and materials for the instructor in such a course to be found in the writings of such men as E. L. Thorndike, H. H. Horne, Judd, and others.

Opinions differ as to the materials and methods best suited to the course. It is not our purpose to choose among them. However, a

course along lines suggested by Thorndike¹ should prove satisfactory. This might include, first, an accurate but brief review of the basic principles of psychology. In this study, dynamic psychology—the connection between outside events and mental states, between one mental state and another, and between mental states and acts—should be emphasized. Study of the anatomy of the nervous system, processes involved in the perception of the external world, and the psychology of any special feelings should be minimized. Instincts, capacities, experience in perception, the association of ideas, and other topics connected with the psychology of learning should be leading topics. The remainder of the time given to the course in educational psychology for vocational teachers may well be divided between the psychological basis of general educational theory, the psychological basis of teaching in the narrow sense, and the special psychology of adolescence.

PRINCIPLES OF EDUCATION.

A course in principles of education for prospective agricultural teachers should include a general survey of the meaning, value, aims, problems, materials, means and agencies, methods and results of modern education. It should be clear and definite. It must be elementary, on a parallel with a beginning course in principles of physics or of political science.

Its object is, obviously, to present to students the fundamentals of reasonably well-attested principles and laws of education and to indicate to them something of the various phases of education and their attendant problems. Special attention should be given to the social aspects of education, bringing out the fact that more and more the merely disciplinary aim of education is giving way to that of adjustment and utility.

Such books as E. L. Thorndike's "Education," E. C. Moore's "What Is Education?", Ruediger's "Principles of Education," and various others published within the past few years offer ample suggestions and materials for the work.

HISTORY OF EDUCATION.

It will be observed that no general course in the history of education is included in our requirements for the vocational agriculture teacher. As usually taught, the history of education contributes little to the preparation of classroom instructors. However, it is desirable that the secondary vocational agriculture teacher know something of the history, development, and present status of the American school system, with special emphasis on the secondary

¹ Thorndike, E. L., Educational psychology. Teachers' College Rec., v. 6, No. 1, p. 20.

school—the type in which he is to teach—its relation to other schools in our educational system, and the history, aims, and principles of vocational education, with special emphasis on agricultural education.

The name and sequence of topics of a course giving this information may vary. The name used in this outline of courses¹ is “Development of American Educational System.” Whatever the nomenclature, such a course should leave with the student fairly clear and definite information and ideas as to—

1. The development of secondary education in America, its relation to elementary and higher education, and the aims and functions of secondary education;

2. The secondary pupil, his physical and mental traits, individual differences, etc.;

3. Means and materials of secondary education, the subjects studied in secondary schools and their values, the organization of secondary education, and methods of teaching in secondary schools.

Throughout the course, the history of the development of secondary vocational education, particularly that of agriculture, and the vocational aspects of secondary education, should be accented.

SPECIAL METHODS IN TEACHING AGRICULTURE.

The importance and potential values of the special methods in teaching agriculture course are obvious. Unfortunately, it is often inefficiently taught, by inadequately equipped teachers. As a result, the materials presented are, too often, vague, theoretical, and widely divorced from actual schoolroom conditions or situations. We must have special methods courses which both present clear, precise knowledge as to teaching technique to our future agriculture teachers, and which set up in their minds definite standards as to the work to be done.

As has been well expressed by Franklin Bobbitt:² “Efficient methods are dependent on definite standards. So long as definite standards are lacking, we can not expect methods to grow efficient. One does not devise expert methods of hitting a mark, nor does he exert himself strenuously in the effort until he has some mark to hit. So long as his task is a mere firing in the air, almost any method will do. But the moment a specific mark is set for him, he must discriminately discard everything useless or relatively ineffective and must equally discriminately choose methods that are relatively efficacious in securing the end in view.”

¹ See table, p. 16.

² F. Bobbitt, “Some general principles of school management applied to city schools.” Society for the study of education, 12th Yearbook, pt. 1, p. 45.

The great difficulty in organizing a special methods course is to select the materials and apportion the time given to different topics or work in such a way that students shall get the utmost value from it in their future teaching work. A wealth of materials is in the subject and more time than is ordinarily available could profitably be given to many topics. It is perhaps needless to state that the courses in special methods should be in the same hands as the supervision of practice teaching work.

Among the things which should not be neglected in a special methods in teaching agriculture course are the following:

1. The aims and objects to be attained in a high school course in agriculture.

2. General organization of agricultural work for the high school.

- a. The high school course of study in agriculture; division of pupil's time between agricultural and other studies; division of time spent in agricultural studies between practical work and school instruction; nature and sequence of individual agricultural courses; modification of the nature and content of high school courses in agriculture, due to local community conditions, the length of the course, the position and sequence of the individual course in the course of study, equipment available, etc.

- b. Home project work; its scope and general plan; project agreements, records and reports.

3. Individual high school courses in agriculture. Home project work as related to high school courses. General survey of the selection and organization of suitable subject matter for each of the various agricultural courses which may properly be given in a high school.

4. Methods of presenting high school agricultural instruction; observation and criticism of demonstration lessons. Supervision of project study and project work.

5. Practice in applying the methods studied as suitable for use in giving high-school instruction in agriculture. (This should not be confused with practice teaching.) Drill in the planning of lessons, laboratory work, field trips, practicums, home projects, etc., for individual courses. Practice in preparing questions for written tests. Practice in setting up and using laboratory apparatus, in preparing illustrative material, etc.

6. Kinds and sources of high-school agricultural materials and equipment, including books and other printed matter, school room and laboratory equipment, illustrative materials, outdoor equipment, etc. Comparative and critical study of high-school agricultural textbooks, to give ability to evaluate them and to use them to the best advantage. Agricultural literature which should be in the school library for the use of the pupil and agricultural literature which

will be helpful to teachers in the preparation of their work. The kinds and sources of equipment useful in agricultural instruction, such as desks, tables, apparatus, lantern slides, etc. Names and catalogues of firms supplying such equipment. Inspection of as many types of equipment as possible and making out of sample lists of equipment to suit different types of schools and within varying cost limits.

SCHOOL ORGANIZATION AND SCHOOL ADMINISTRATION.

No separate courses in school organization or school management are listed for the prospective teacher of vocational agriculture. This is because it seems perfectly feasible to give the needed facts in the field of school management in connection with the practice teaching work. A course in school administration is desirable for prospective supervisors or directors of agricultural work in the schools, but all that is necessary for the vocational agriculture teacher can undoubtedly be given in connection with other recommended courses.

PRACTICAL PROFESSIONAL TRAINING.

The practical phase of a vocational agriculture teacher's professional training should be of two types:

1. Observation of good secondary agriculture teaching.
2. Practice teaching of agriculture in a secondary school.

Regardless of the extent of his technical and professional knowledge and his will to do good work, the successful teacher must have skill. But skill requires practice; and observation is a needed preparatory step for the successful practice of teaching, as of any other art.

We can not expect the prospective agriculture teacher to master the technique of the teaching process before he goes out to teach, but we ought to give him an opportunity to see and to recognize good teaching and to know why it is good. Moreover, he should have opportunities for the observation of skilled teaching of his subject in the type of school in which he expects to serve, with pupils of the age he expects to teach.

Following or parallel with observation of teaching and the acquisition of ability to recognize faults and excellencies in teaching should come practice teaching. Trying to teach a man to teach without giving him an opportunity to do practice teaching under guidance has been aptly compared with trying to teach a student to swim by giving him a course in buoyancy and aquatics with no opportunity to prove the worth of these principles or to see other swimmers at work.

Prospective teachers should have a chance to verify by their own tests, before they enter employment, the theoretical principles which they have been taught to accept and to gain some facility in the processes employed in instruction. It is of little advantage to a teacher to know how to discuss intelligently the principle of apperception with its various implications, if he makes no use of it in the classroom.

The first teaching is practice teaching any way, whether it is done in connection with training or after a teacher is employed by a community. It is certainly preferable for teachers to get some skill in teaching while in training, rather than entirely at the expense of their pupils and the community in which they teach for the first year or two.

OBSERVATION OF TEACHING.

Though the need for both the observation and practice of teaching as an integral part of the professional preparation of teachers is everywhere recognized, work along both lines varies in teacher-training institutions from carefully organized courses to work that is desultory and almost valueless.

Observation of teaching as a part of the training of the prospective teacher should follow a definitely outlined plan. It should be systematic and progressive. It should make a distinct contribution to the training of teachers. Unorganized observation, or observation which does not justify itself by results, should be eliminated.

In order to secure satisfactory results, students must be taught how to observe and what to observe. The value of the work will depend upon the extent to which the observer seeks definite information. Definite and progressive outlines should be prepared for the guidance of students in observation, or students should be prepared in preliminary class or conference periods for observation work assigned.

The beginning science student does not know how to use a microscope. He must be taught. Just so, the beginning student of the practice of teaching does not know how to observe teaching to the best advantage. He must be taught to see and note what is significant. He should be able to accurately record the data observed and to apply that data to better appreciation or solution of problems of teaching.

It is difficult to say just how much observation work should be required of the prospective teacher. A limited amount, well planned and prepared for, is better than a great deal which is haphazard and pointless.¹ Certainly no student should go out to teach vocational

¹ C. R. Maxwell's "Observation of Teaching" (Houghton Mifflin Co., 1917) should prove useful in this connection.

agriculture in a secondary school without having observed some teaching of his subject in that type of school.

OBSERVATION COLLECTION OR MUSEUM.

Though it is not directly connected with the subject of student observation of teaching, the "observation collection or museum" may be mentioned here.

Every agricultural teacher-training department may well maintain, for use in connection with its special methods courses and practice teaching, an "educational museum" wherein may be displayed useful agricultural education appliances, illustrative materials, samples of work of secondary agricultural pupils, text books, catalogues of school equipment, etc. To secure the best results this is essential.

PRACTICE TEACHING.

Agreement as to the desirability of practice teaching for secondary teachers of agriculture is fairly general, but its provision is more rare. There are, obviously, difficulties in the way. All sorts of plans have been tried, with varying success.

In the attempt to provide practice teaching for prospective secondary teachers, teacher-training departments have utilized:

1. Local public high schools.
2. Schools maintained by the university or training department for practice purposes.
3. Special secondary schools, as for example, agricultural schools maintained by the university.
4. College classes.
5. Grammar or elementary schools.
6. The "moot court" system (teaching before the training class to which the student belongs).
7. Public high schools at a distance from the university.

In order to secure satisfactory teacher-training results from practice teaching, pupils in practice classes should be of an age to be taught after the student teacher completes his preparation, and the type of school should be the type of school in which he expects to teach. This eliminates the use of grammar school and college classes and of the "moot court" system. Secondary schools maintained by the university or training department and special secondary schools of agriculture (whether maintained by the university or not connected with it) present some advantages for vocational agriculture practice teaching and may be utilized to a certain extent. However, cadetship in good public high schools is undoubtedly the most satisfactory solution of the problem.

Practice teaching in selected public schools having well developed departments of agriculture presents, as nearly as possible, normal

conditions for the work. It affords the practice teacher contact with typical high school students and with a typical school community. It utilizes schools of the type in which the practice teacher expects to teach. The age, associations, environment and future prospects of pupils taught are similar to those of pupils with whom the practice teacher will probably have to deal in his future work. Contact with an agricultural community as related to a school is secured through participation in inspection of home projects, community work of the local teacher, etc. This last is an advantage of this system of practice teaching which is, obviously, of much importance and not so satisfactorily to be secured through any other system. A secondary but very evident advantage of practice teaching in a number of carefully selected public high schools is that it gives a wide and varied range of experience to the practice teaching class as a whole. Lessons and suggestions may be drawn from the experience of each member of the class for the benefit of others. Finally, though practice teaching undoubtedly adds to the problems of the selected schools, it does, at the same time, give a helpful stimulus to their work.

The demands of practice teaching should be progressive, from little to much, from the simple to the complex. It should be sufficiently strenuous to require the student's best efforts, but not so great as to overwhelm him and cause the quality of his work to suffer. It should extend over a sufficient period to permit a variety of experience, the recognition of personal teaching weaknesses and abilities, the gaining of a degree of self-confidence and a feeling of progression in teaching power.

The teaching of a few sporadic lessons will not bring the results desired. If possible, the prospective teacher should first observe in the classroom with a view to his future teaching of the class. He may then act as an assistant, prepare lesson plans for criticism, teach a single lesson and, finally, take charge of the class for several lessons. He should, at the beginning of his practice teaching work, accompany the local teacher on trips for supervision of home projects, gaining familiarity with the projects going on and the conditions under which the boys engaged in them are working. Later, he may take an active part as an assistant in supervising project work, checking up reports, keeping records, etc. During his practice teaching period the student teacher should make a survey and study of local school and agricultural conditions similar to that which an agricultural teacher should make as a preliminary to taking up work in a new school and community. A report concerning this community survey or study may well be required by the director of practice-teaching training as an essential phase of the work.

Whatever the type of school in which the practice teaching is given, the work must be planned and supervised with great care.

if the results desired are to be secured. Supervision should be close enough to insure thorough preparation on the part of the student teacher and to prevent the repetition of mistakes. A typical and satisfactory arrangement for supervision is cooperation of some person in the education department with some person connected with the practice school, as for example the regular teacher of the class used for practice teaching.

Criticism of practice teaching should be intelligent, sympathetic, and thorough. The use of a score card for rating student teachers, organizing the qualities of merit necessary for successful teaching under such heads as "preparation," "teaching skill," "classroom management," and "personality," is advocated by some educators¹ and presents distinct advantages in spite of the danger that it may become overmechanical. The principal arguments put forth for the use of the score card are that in the hands of the critic teacher the score-card analysis tends to promote comprehensiveness of judgment in rating the student's teaching efficiency, is an aid in giving a just proportion of credit to each of the fundamental qualities, and, since it designates clearly points of weakness and strength in the student, it aids the critic teacher in giving advice and help to the student teacher. In the hands of the student teacher, this score card analysis tends to promote self-knowledge, self-criticism and self-improvement. As a part of the school records, such as a score-card offers a basis for recommending graduates for appointments and will prove useful in case "follow-up" work with graduates is attempted.

Whether a score card is used or not, careful records should be kept of the practice teacher's work, both for present use and later reference. Critic teachers and supervisors of practice teaching work should be thoroughly familiar with literature and studies concerning the qualities of merit in teachers and the various aspects of practice teaching, supervision, and criticism.

GENERAL PROBLEM OF TRAINING TEACHERS FOR THE SECONDARY FIELD AS RELATED TO TRAINING TEACHERS OF VOCATIONAL AGRICULTURE.

What has been said above relates distinctly to the needs and demands of training prospective teachers of vocational agriculture for secondary schools. That we have outlined no exorbitant requirements is evident when we consider the nature of the subject to be taught and the aims and methods involved in such instruction. Moreover, the qualifications considered by educational authorities as imperative for secondary teachers of nonvocational subjects, most of which do not present the difficulties or have the wide scope of the agricultural work, support our argument.

¹ H. A. Sprague, *Ped. sem.* 24, 72-80.

RECOMMENDATIONS OF THE "COMMITTEE OF SEVENTEEN" ON THE TRAINING OF SECONDARY SCHOOL TEACHERS.

According to the recommendations of the "Committee of Seventeen," the minimum requirements for a secondary school teacher should be "graduation from a college maintaining a four-year course and requiring four years' high school work for admission. * * * A year of graduate work divided between academic and professional subjects is desirable."

With regard to the preparation of secondary teachers, the recommendations of the "committee," briefly summarized, are that it include the following:

I. Theoretical training:

(a) History of education.

1. General education.

2. Secondary education.

(b) Educational psychology with emphasis on adolescence.

(c) Principles of education, including the study of educational aims, values, and processes.

(d) Special methods in the secondary school subjects that the student expects to teach.

(e) Organization and management of schools and school systems.

(f) School hygiene.

II. Practical training:

Observation and practice teaching with secondary pupils.

CARNEGIE FOUNDATION REPORT ON TEACHER TRAINING.

The Carnegie Foundation for the advancement of teaching, 1917 report on teacher training curricula recommends differentiation in professional training courses in respect to the larger divisions of the teaching service, as the grammar grades, junior high school, high school, etc., and still further differentiation as to subject groups, as agriculture, history, etc. The justification of this rests in the fact that "the training now clearly indispensable to efficient teaching has become so specialized as to preclude the satisfactory initial preparation of a prospective teacher for any but a limited range or a specific type of school."

The report further states that each course in teacher training should be definitely designed to prepare for a specific teaching position; that it should place special emphasis upon the specific subject matter which finds a place in the schools for which preparation is being made, and that it should emphasize the reasons why the sub-

ject matter under discussion occupies the important place it does in the scheme of education, its relation to advanced work along the same lines, its historical development, and its organization for instruction in schools of the type prepared for.

Though it is not our purpose to discuss here the training of any other than secondary teachers of agriculture, it may be said that in the professional training of all secondary vocational teachers (including home economics and trades and industries) economy may be effected by giving joint instruction in educational psychology, principles of education, and the history and principles of American secondary education. In the "special methods" and succeeding professional training there must, of course, be differentiation.

AGRICULTURAL TEACHER-TRAINING INSTITUTIONS.

It is evident from the type of teacher training outlined above that the proper training of the agricultural teacher demands a special type of institution and instructors. Any institution which receives aid for teacher-training purposes from the vocational education funds provided by the Smith-Hughes Act must, according to the provisions of the act, be under the supervision of the State board and is subject to inspection by representatives of the State board and Federal Board from time to time in order to determine whether the work is coming up to the standard set. The policy of each State should be to designate for the training of vocational agriculture teachers that institution which is best qualified to offer adequate courses.

As indicated in Federal Board for Vocational Education Bulletin No. 18, an institution which trains vocational agriculture teachers should be in touch with the latest developments in the field of scientific agriculture, especially in so far as these developments relate directly to the agriculture of the State or section of the country in which the institution is located. The institution should have the facilities for and be engaged in the teaching of agriculture as a vocation. It should give instruction in classes in technical agriculture from the standpoint of the use of the results of this instruction in the field of practical agriculture. It will therefore require farms, farm animals, farm buildings, and farm equipment, as well as adequate laboratories.

Such an institution should be in touch with the farmers of the State in which it is located, in order that there may be direct contact with the condition and the development of agriculture in the State. It should be in touch with rural organizations and societies of the State. It should have suitable, adequate, up-to-date equipment for use in connection with instruction in both practical and technical agriculture.

The institution must have adequate facilities for instruction in all the subjects which experience shows to be necessary for the training of adequately equipped teachers of secondary vocational agriculture. This means that there must be competent instruction in English, citizenship, history, sociology, and economics. It means that there must be adequate laboratories for instruction in the sciences related to agriculture. It means that there must be adequate equipment and facilities for instruction in the theory and practice of teaching.

EXTENSION WORK BY TEACHER-TRAINING DEPARTMENTS.

The first obligation of a teacher-training department is, obviously, to do efficiently the work for which it is organized—that is, the training of teachers. No extension work can be allowed to interfere with or deflect attention from this.

The most common form of extension work—miscellaneous lecturing on educational topics before teachers' institutes by members of the teacher-training department—does not ordinarily bring adequate results in either the improvement or edification of teachers in service. But some forms of extension work add to rather than detract from teacher-training efficiency. The teacher-training school needs and must have a certain amount of contact with teachers in service and with their work in order to do its work to the best advantage. Moreover, the teacher-training institution should stand ready at all times to lend a hand to its graduates or to other teachers in service. Practically all teacher-training departments will therefore find it advisable to undertake some forms of so-called extension work. What this work shall be, in the case of the individual institution, will depend on local needs and possibilities.

One type of extension service which may well be maintained by every teacher-training department is a school service and information bureau. The function of such a bureau is to invite and answer questions of teachers in service with regard to their problems and to act as a collector and repository of useful criticism, suggestions, and information. Such a bureau should include in its work the collection and classification of important current events in agricultural education and should list and digest the more important agricultural education publications. It should stand ready to pass on the results of experience, experiment, and investigation to teachers in service at any time, as need or opportunity arises.

QUALIFICATIONS OF INSTRUCTORS IN VOCATIONAL TEACHER TRAINING.

Men entrusted with the professional phase of vocational teacher-training work should have special fitness and preparation for the

work. They should be of wide training and experience, with both the vocational and a professional point of view.

This need is perhaps most striking in the case of instructors in charge of special methods courses and practice teaching. The work of the special methods in agriculture teacher, for example, is to train secondary teachers of vocational agriculture to do two things, (1) to teach; and (2) to make farmers. He must himself be trained for farming as well as for teaching. It is his duty to see to it that methods of teaching are intelligently connected with agriculture in the mind of the teacher-student and that the vocational aim of the teaching is not subordinated to or enslaved by teaching methods. On the other hand, the instructor in special methods and practice teaching must, obviously, have an adequate knowledge of the technique of teaching.

Teaching to teach is a higher art than simply teaching. It must lead to professional skill as well as to professional knowledge; and it must give ability to develop vocational knowledge and skill in pupils. Since this is true, only men who can themselves teach secondary pupils efficiently should be permitted to teach prospective secondary teachers. Moreover, the instructor in special methods of teaching any vocational subject should be a person who fully realizes the value of professional training and who has had at least as much training in general education (psychology, principles of education, etc.) as his pupils are required to have as prerequisites for taking the special methods course. He should have given some special study to secondary schools and secondary school teaching methods and he should have had at least two years' successful experience in teaching in a secondary school, preferably teaching the subject in which he now offers a special methods course.

Briefly summarized, the training and experience which should be considered essential for the teacher of special methods in teaching vocational agriculture are—graduation from a four-year college course in agriculture; one year of graduate work, largely in education; and two years' experience in teaching vocational agriculture to secondary pupils.

Special fitness for his work is almost equally important for the instructor in other professional courses for the future vocational teacher.

The teacher of educational psychology should be well grounded in general and experimental psychology and be familiar with related fields. He should have the educational, as well as the psychological viewpoint, and should be an experienced teacher.

The instructor in principles of education should, in addition to his theoretical information, have a fund of practical experience gained in public school teaching to draw upon.

Perhaps most imperative of all is the necessity for suitable qualifications for the supervisor of practice teaching. He should have adequate theoretical knowledge of psychology, principles of education and related subjects. He must have teaching experience and skill, thorough knowledge of conditions and needs in the type of schools in which practice work is carried on, familiarity with the individual practice schools, and intelligent understanding and sympathy for the young teacher's problems.

The importance of suitable qualifications in instructors of prospective vocational teachers can hardly be over-emphasized. We can not get well trained agricultural teachers from inadequately organized, inefficiently conducted teacher-training departments, any more than we can get satisfactorily trained agricultural graduates from high schools in which the agricultural work is organized and presented by inadequately trained secondary agriculture teachers. The training of teachers of vocational agriculture is a big task, worthy of the respect of the most able men interested in agricultural education. The best training and effort is none too good for it.

SELECTION OF INSTRUCTORS FOR VOCATIONAL TEACHER-TRAINING DEPARTMENTS.

The quality of the work done in teacher-training departments could, in many cases, be appreciably raised by using greater care than is common in the selection of additions to the faculty.

One common mistake is noted in "Self-surveys by Colleges and Universities," by W. H. Allen, when he says: "In too many instances mere propinquity determines the selection of college instructors—as of wives and husbands. Prof. A. has a liking for Mr. B., who has tried hard in his courses, or gives promise of research ability. The position opens; Mr. B. is there, he is likable. Without analyzing Mr. B.'s work and qualities with special reference to teaching requirements, and without seeking five or twenty competitors with whom to measure him, Prof. A. propinquity and Mr. B. joins the faculty."

When a position is to be filled, steps should be taken to learn about a large number of persons fitted for the position; the duties and opportunities of the position should be thoroughly made known; colleagues in other institutions should be notified, as also other persons likely to be interested or qualified; and the qualifications desired in personality, training and experience should be specifically defined and applied in considering candidates. If an individual possessing all the desired qualifications is not found to be available, the institution should discover the individual who, with partially satisfactory training and experience, has the necessary interest and

capacity, and should arrange for him to acquire the needed additional training or experience.

SELF-SURVEYS BY TEACHER-TRAINING DEPARTMENTS.

In order to clearly define and maintain desirable standards, every teacher-training department should continually and progressively self-survey itself. Its course of study, the content of individual courses, instructional efficiency, and all other matters connected with the running of the department should be closely scrutinized for the detection of weakness and strength. It is as imperative that the factors involved in efficiency in teacher-training be determined and used in evaluating the work of a teacher-training department as it is that efficiency factors be determined in commercial and industrial undertakings. The modern conditions which have led to the study of wastes in material, energy, and time in production, and plans for their elimination, demand similar investigations as to our educational efficiency.

TRAINING OF SPECIAL TEACHERS OF AGRICULTURE.

We have, so far, considered only the preparation of school-trained agricultural students as teachers of agriculture. They are trained for all-the-year-round service and for basic instruction in any or all of the agricultural industries. This training must necessarily be thorough, comprehensive, and extended over a considerable period of time.

There is another class of persons who can, and will, increasingly, be utilized for certain forms of agricultural teaching. These are men who, with or without agricultural schooling, have proved conspicuously successful and progressive in farming industries or enterprises.

They may be agricultural school or college graduates; they may only be graduates of the hard work and experience course in practical farming. They have not the desired training and experience, nor are they willing, to enlist all their time in vocational agricultural education service. Yet they can frequently be utilized as "limited service" men—that is, for example, the dairyman of long and valuable experience may give a special short or evening course in dairying; the poultryman may give a special course in poultry raising; or the expert vineyardist may give a course in grape growing.

These persons are prepared for such work, in so far as vocational knowledge and experience are concerned, but they lack training for teaching. They can not, obviously, be expected to take time for any extended course of training. On the other hand, they should not be certified or permitted to do this teaching work without sufficient

training for it to warrant confidence that the materials of the special topics courses will be organized and presented in such a way as to secure satisfactory results.

The training given must be condensed—given within a brief period of time. It must be directly applicable to the problems with which the teachers will have to deal. It must give very definite help in organizing the course, planning lessons, planning practical work, choosing and using equipment, assigning work to students, etc. Such training is not merely a special-method course “boiled down.” It should tell and show each special topic course teacher just how to put his job over. It should give him the information and guides which he needs and put in his hands any available helps for conducting the work.

The training may be given in a special short course at the State teacher-training institution, or it may be given to groups in sectional or county centers where the number of special teachers to be prepared will justify this. In such case it becomes, obviously, a form of itinerant teacher training.

It may consist of brief, intensely concentrated training covering full time for a short period, or it may be given on selected days or evenings, scattered over a longer period. However, this last arrangement is practicable only in the case of itinerant training of groups in selected centers, in which case the instructor goes from group to group. Intensive training, closely preceding the period of service, presents superior advantages.

CERTIFICATION OF TEACHERS.

As a corollary to a discussion of teacher training, the certification of teachers may well be considered.

The great diversity of the requirements for certification of teachers in the different States and the unwillingness shown by many States to recognize equivalent qualifications or training secured elsewhere are two marked and undesirable characteristics of our educational system. We need greater uniformity in certification in different States. In many cases certification requirements should be raised. Following a raising and standardizing of professional demands, most barriers to recertification in different States might well be removed—equivalents in training, in certification, and in experience forming the basis for such recertification. Each State must of course be allowed to set its own standards, and a State can not be expected to grant reciprocity to, or to accept certification coming from, States which represent lower professional standards than its own. But every State should welcome teachers from States having higher professional standards than its own and should endeavor to

bring up its own standards to a degree where it secures reciprocity from all other States. It should be remembered that the aim of certification is not to create a restricted eligible body of teachers, but to prevent teachers not having certain minimum qualifications from getting a job.

For vocational agricultural teachers, there should be separate certification, granted by the State Board of Vocational Education. It should be based on vocational experience, technical preparation and professional training. For beginning teachers, it is preferable that a preliminary or probationary certificate be issued, to expire at the end of the first year's teaching. At the end of the year, further certification, possibly for a five-year period, may be granted if the candidate has shown satisfactory ability in actual service.

While preliminary certification should be based largely on credentials, it should not be granted without personal interviews by at least two, and preferably three, persons having official responsibility for such interviews. These interviews should be reported in such form as to become a credential in each case. Their purpose is to gain increased knowledge as to the candidate's experience and training and to form an estimate as to his personal equipment in appearance, health, vigor, social adaptability, etc.

The credentials asked and submitted in support of a request for preliminary certification should include anything which can be exhibited as evidence bearing on any feature of the candidate's qualifications for teaching, as diplomas, certificates, personal statements of former teachers or employers, published writings on education or agriculture, evidence of teaching ability as a practice teacher, etc. A written examination may or may not be included in the requirements for certification. The tendency, fortunately, is to eliminate the written examination.

Renewal of a certificate at the end of a probationary year should be based on: (1) Reports of the State Supervisor of Vocational Education and other State agents inspecting the work of the school as a part of their duties; (2) the written opinion and recommendation of local authorities covering the teacher's record; (3) a written report by the candidate giving information on requested topics, as, for example, methods of handling specific teaching problems in secondary agriculture. All projects undertaken for the professional improvement of the teacher in service (as short courses, investigational work, practical work, etc.) should be reported and recorded with the teacher's credentials, whether application is being made for a certificate at the time or not.

Still another type of certificate may be issued to persons teaching short-unit courses covering special topics, as, for example, a six-weeks course in dairy work. Such a course may often be given by

a person with valuable vocational knowledge and experience, as by a successful dairy farmer, who lacks professional and technical schooling. In such cases certification is based on vocational experience and knowledge, but should be only for the course described and for the year or definite period of time when the course is given.

Each State has now in its plan for vocational education set up a standard for certification of teachers of agriculture. Since these plans are reviewed and submitted to the Federal Board of Vocational Education for approval annually, there is good justification for the belief that a very few years will see a greatly improved and much more uniform system of certification for teachers of vocational agriculture than we now have.

TRAINING OF TEACHERS IN SERVICE.

A matter deserving more attention and a more intelligent and systematic approach than has been usual in the past is the training of agricultural teachers in service.

The professional improvement of a teacher should not stop with the getting of a diploma, a certificate, and a job. No matter how carefully the work of the teacher-training institution is planned and executed, it can not be expected to turn out a perfect product. Experience, supervision, and aftertraining of teachers in service must work together to develop to the highest possible degree the abilities and potential talents of the individual teacher.

Any systematic scheme for the professional improvement of agricultural teachers in service must provide for visits to each teacher at his school, to discover his special problems and needs, to search out his teaching weakness and strength, and to give him help in conducting and improving his teaching work. It should provide for State and sectional meetings each year, when vocational agriculture teachers come together for several days for instruction and conference. It should provide for and require periods of or projects in professional improvement for teachers in service. Finally, any such scheme must provide for definite reports from teachers as to their work and professional improvement undertakings and for checking up these reports that trustworthy records may be available. It is as necessary for records to be kept of the professional progress and improvement of teachers in service as it is for records to be kept of the progressive steps in the training of the teacher for service. In the later case it is needed for the just evaluation and crediting of the work of the prospective teacher and as an aid in his future placement. In the case of the teacher in service it is useful for consideration in certification, in salary recommendations, in recommendations involving changes in positions, etc.

ITINERANT TEACHING.

One of the most effective means for the training of the teacher in service is through itinerant teaching. Broadly speaking, itinerant teaching may be defined as that form of teaching in which the teacher goes to those to be taught rather than the usual form in which those to be taught come to the teacher.

As related to the training of teachers in service, its object is two-fold: (1) To keep the work in the schools up to a certain standard; and (2) to correct faults or develop talents in the teacher.

As utilized in the training of teachers in service, it ordinarily means individual instruction of the teacher in service, at the school he serves, by a competent person whose duty it is to carry on such work where needed. It implies going here, there, anywhere and everywhere in a State where a teacher is not doing the desired kind of work and camping with him or going back to him until he gains enough additional knowledge and skill to meet his problems more efficiently. At least during the first year of service, practically every teacher needs a certain amount of systematic instruction and watchful guidance. Giving this instruction and guidance is one phase of itinerant teaching work.

It is perhaps needless to say that the work of the itinerant teacher should be very definite, very practical, very much to the point. It should also be very tactful and sympathetic. Criticisms should be inspiring, not depressing; constructive, not destructive. The work of the itinerant teacher should be so done that teachers are glad to have him come to them and accept his help with pleasure.

The itinerant teacher goes to a teacher because that teacher is not doing his work as efficiently as he should. If the teacher has failed to organize his work to advantage, he helps him reorganize it. If the teacher does not have needed information, the itinerant teacher sees that he gets it. If the teacher is not using his information in the right way, he shows him how to use it. If he is failing in class and boy management, the problem is studied and he is helped to solve it.

Though the work of the itinerant teacher is usually individual, it may become group instruction under some circumstances. For example, it may be found advisable for him to give group instruction along certain lines to agricultural teachers of a given county or section of the State on selected dates, when they assemble for the purpose.

AGRICULTURAL TEACHER MEETINGS AND CONFERENCES.

A second effective means for the professional improvement of teachers in service is the State and the sectional meeting of agricul-

tural teachers for conference, demonstrations, etc. These are usually, but not necessarily, of annual occurrence only. They should, in order to secure satisfactory results, continue from three days to a week and their programs should include reports on problems met and work done, practical agriculture and teaching demonstrations, round-table discussions and special conferences. Lectures on agricultural education and related topics may be included but should not be permitted to monopolize the time.

A desirable State plan for such conferences provides for a summer and a winter conference of agricultural teachers—the summer conference being a sectional conference and the winter a State conference. The summer or sectional conference may very well be confined principally to agricultural teaching materials and methods, especially as related to the special and sectional problems most likely to come before the teachers attending the conference. The winter or State conference may be of a more general nature, presenting problems in vocational education relationships, new teaching methods, improved agricultural practices, etc. While such a sectional conference deals particularly with teaching problems, the State conference is preferably devoted more especially to the professional improvement of the teacher.

The summer conference may be of an itinerant nature, as in Massachusetts, the attendants going from one school to another in the section as the conference proceeds. Such an itinerant conference stimulates interest and presents other special advantages. One of the most obvious of these is that it permits inspection of the equipment and work of a number of schools and makes it possible to have reports given where the work reported upon can be seen.

The winter conference may be held at a single place, as for example, at the State agricultural teacher-training institution. It should be at a place where facilities for the instruction and professional improvement of the agricultural teacher may easily be concentrated.

PROFESSIONAL IMPROVEMENT PROJECTS.

A third means for the professional improvement of the agricultural teacher in service is the individual professional improvement project.

Continued professional growth should be demanded of the vocational agriculture teacher both by himself and by our educational system. A just, practical, and definite plan for securing and recording the professional improvement efforts of teachers should be incorporated in the agricultural education scheme of each State. This should provide for time and opportunity for teachers to do such

work in such a way that it will make no undue or unfair demand upon them yet will insure their continued progress along lines of increased efficiency. It should insure that teachers undertake professional improvement work calculated to meet their special needs and giving definite promise of making them more useful as agricultural teachers. Haphazard, more or less unrelated efforts at professional improvement show meager results. Effort over a given period should be definite and, preferably, limited to a single project requiring concentrated attention and effort.

In Massachusetts, where the professional improvement project plan for agricultural teachers had its birth and first trial, it is required that every teacher undertake and carry on an approved professional improvement project annually. This may be undertaken in winter or in summer. The time given to it may or may not be concurrent with teaching. As would be expected, the nature of projects undertaken varies widely.¹

For some agricultural teachers the need for professional improvement may be met by special summer or short courses; for others, lacking in some needed phase of farm experience, actual work on a farm, in a dairy, in a poultry plant, or in a nursery may be the most helpful means of improvement; for still others investigation of some definite problem or condition in rural economics or sociology (as marketing conditions and needs in a given district) may afford the progressive training to be desired. The method by which progress is attained is important only in proportion to its effectiveness. The essential is to forge ahead.

FOUNDATION FOR TRAINING OF TEACHERS IN SERVICE.

RELATION BETWEEN TEACHER-TRAINING INSTITUTION AND THE STATE SUPERVISOR OF AGRICULTURE.

The logical foundation for the training of agricultural teachers in service is cooperation between the agricultural teacher-training institution and the supervisor of agricultural education in a State. Each is interested in and to a certain extent obligated to undertake work of this nature. The work of neither can attain its most successful development in a State except through cordial cooperation with the other. Every effort should therefore be made to insure that each helps the other and that neither in any way belittles the activities of the other.

Through such cooperation the teacher-training institution supplies the supervisor with much useful information as to the personality, preparation, and abilities of many of the teachers under his charge, while the supervisor brings to the training institution reports as to

¹ Federal Board for Vocational Education Bulletin No. 26, p. 29.

the quality of its products and ways in which they can be improved. If the supervisor and the teacher-training institution are adequately equipped for their work and have a right attitude as to cooperation, they can be of constant help to each other.

As related to itinerant teaching for the improvement of teachers in service, cooperation between the State agricultural teacher-training institution and the State supervisor of agriculture presents many advantages.

Itinerant teaching for vocational teachers should undoubtedly be conducted under the direction and control of the State supervisors of vocational education—for agriculture, for home economics, and for trades and industries. But it is reasonable to believe that it can be conducted with special economy and efficiency if the work is done in cooperation with the agricultural teacher-training institution.

The teacher-training institution should have teacher-training experts who are practiced in painstakingly teaching prospective teachers just how to plan and present lessons, why certain methods should be chosen in preference to others, just how to plan and inspect project work, to choose and use equipment, etc.

Every up-to-the-minute teacher-training institution is constantly studying new methods, watching experiments, devising ways in which to make the work of a teacher go more smoothly and efficiently. It is quite possible that the institution may have something to offer to teachers in service from time to time which will increase their efficiency. On the other hand, teacher-training institutions need contact with teachers in service and their schools in order to do their work of preparing teachers most efficiently.

It is the duty of the agricultural supervisor to inspect, check up, and report on agricultural teachers and the work done by them in the schools. But while he is a policing officer, charged with the duty of determining whether or not the agricultural work of the individual teacher and school meets the standards set up for it, he is also, as a part of the administrative personnel of the agricultural education system of the State, charged with responsibility for the conduct and success of the work in the schools which he inspects. His work as a supervisor is inadequately done if it does not result in an improved quality of instruction. It is his duty to discover and point out individual weakness and strength in teachers, to supply them with information as to the work expected from them, the standards to be reached, and various other matters. He must in every way stimulate high quality in the work. Given these conditions, it seems wise for the supervising agent to cooperate with the already well-developed teacher-training agency, delegating to it certain duties, including possibly more or less itinerant teaching.

By a cooperative arrangement the State supervisor may retain full control of all itinerant teacher training while the actual work is done by the teacher-training institution. The supervisor indicates the needs, while the institution puts at his disposal all or a part of the time of one of its men, who will, at the call of the supervisor, go to any agriculture teacher in the State and give to him the help which the supervisor sees that he needs.

By a suitable cooperative arrangement, the supervisor retains full control of the work and gets the thing done which he wants done. The teacher-training institution gets contact with schools and with teachers and their problems, and it needs this contact in order to make its regular work most effective.

It gets the opportunity to see its own products at work and to help them correct their faults. Some of the teachers worked with will, of course, come from other teacher-training institutions. Contact with these teachers is of advantage to the institution as well as to the teachers. The work of products of a sister institution will often stimulate thought and methods in the home institution.

The teacher-training institution gives a certain amount of time and service to itinerant teaching. The supervisor should, if possible, give some time to the instruction of prospective teachers at the teacher-training institution. He may perhaps give a summer course. He should at least have several lecture periods before students in training that he may present to them his views regarding their future work and its problems.

Incidentally it may be said that one way in which the teacher-training institution can help the supervisor and at the same time add to its own efficiency is by keeping carefully planned student and alumni records. There should be on file at the teacher-training institution a much wider, more accurate sum of knowledge concerning every student of the school, both present and past, than that supplied by a few figured grades or the gradually fading impressions of teachers as to the student's work. Student records should show both scholarship and professional progress. So far as possible, records should present an "inventory" of the individual student's personality, his teaching equipment, and his capabilities both before and after the completion of his professional work. Records of alumni should show whether the former student is teaching or not; and if so, where, and at what salary. The positions of a student following graduation should be recorded and any available information as to his successes or failures recorded and analyzed. These records will be of advantage not only as a matter of information but as an aid in finding and correcting weakness in the training system.

Because of the important part which the supervisor must play in any effective, systematic scheme for the training of teachers in service, it is most important that supervisors be adequately qualified for their work. The supervision of vocational agriculture instruction is not merely an "educational job" for which a degree of general educational training and experience fits. Such work demands special preparation and qualifications. The supervisor of vocational agricultural education should be a man who has had both agricultural and professional training and experience. His qualifications should include those for a teacher of agriculture and at least two years of successful experience in teaching agriculture. In addition, administrative knowledge is necessary and administrative experience a distinct advantage.

The agricultural supervisor should know both school and farm problems. He should have a full understanding of the elements of weakness and strength in vocational agriculture teachers and definite standards by which work is checked up. He should be, in relation to the vocational agriculture work which he supervises, an efficiency expert, able to detect readily the elements of success and determine the causes of failure in work done and able to make the individual teacher see and estimate the weakness and strength of his own work. He should be familiar with the various ways and means which have been devised for measuring teaching efficiency, but should use common sense and intelligence in their use or disuse.

His influence should make for increased efficiency all along the line. Ability to discern excellencies in work quickly and surely is a more valuable faculty than that for seeing faults. Ability to discover, develop, and use abilities in other people is a distinguishing mark of our most successful men of business. It is of equal value to the educational administrator.

The advantages and possibilities of cooperative effort in promoting the professional improvement of teachers in service through conferences, special instructional courses, improvement projects, etc., are evident and will not be discussed here.

It should be noted that through cooperation of the teacher-training institution and the State supervisor, certification and the placing of teachers may be made more satisfactory than has ordinarily been the case in the past. This is especially true where a probationary certificate is given for the first year.

The supervisor knows the special needs of districts and schools in the State. The institution knows intimately the capabilities of students. By conference and cooperation the number of failures and misfits should be greatly reduced.

Whatever the nature of the cooperative arrangement between a teacher-training institution and the State supervisor—whether for

itinerant teaching or for other work related to the training of teachers in service—it should, of course, be thoroughly understood by both parties. It is probably desirable to have some form of written agreement between the State Board for Vocational Education and the vocational teacher-training institution as to such cooperation. But there should be little difficulty in coming to an agreement satisfactory to both parties.

PUBLICATIONS OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

Annual Report.

The Vocational Summary, published monthly by the Federal Board for Vocational Education (vol. 1, No. 1, May, 1918).

Bulletin No. 1. Statement of Policies.

- **Bulletin No. 2. Training Conscripted Men for Service as Radio and Buzzer Operators in the United States Army (International Code).**

Bulletin No. 3. Emergency Training in Shipbuilding—Evening and Part-Time Classes for Shipyard Workers.

- **Bulletin No. 4. Mechanical and Technical Training for Conscripted Men (Air Division, U. S. Signal Corps).**

Bulletin No. 5 (Reeducation Series No. 1). Vocational Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 166.)

Bulletin No. 6 (Reeducation Series No. 2). Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 167.)

- **Bulletin No. 7. Emergency War Training for Motor-Truck Drivers and Chauffeurs.**
- **Bulletin No. 8. Emergency War Training for Machine-Shop Occupations, Blacksmithing, Sheet-Metal Working, and Pipe Fitting.**
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Bulletin No. 13 (Agricultural Series No. 1). Agricultural Education—Organization and Administration.

Bulletin No. 14 (Agricultural Series No. 2). Reference Material for Vocational Agricultural Instruction.

Bulletin No. 15 (Reeducation Series No. 3). The Evolution of National Systems of Vocational Reeducation for Disabled Soldiers and Sailors.

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Bulletin No. 19 (Trade and Industrial Series No. 3). Part-Time Trade and Industrial Education.

Bulletin No. 20. (Trade and Industrial Series No. 4). Buildings and Equipment for Schools and Classes in Trade and Industrial Subjects.

Bulletin No. 21 (Agricultural Series No. 3). The Home Project as a Phase of Vocational Agricultural Education.

Bulletin No. 22 (Commercial Education Series No. 1). Retail Selling.

Bulletin No. 23 (Home Economics Series No. 1). Clothing for the Family.

Bulletin No. 24 (Commercial Education Series No. 4). Vocational Education for Foreign Trade and Shipping.

Bulletin No. 25 (Reeducation Series No. 4). Ward Occupations.

Bulletin No. 26 (Agricultural Series No. 4). Agricultural Education—Some Problems in State Supervision.

Bulletin No. 27 (Agricultural Series No. 5). The Training of Teachers of Vocational Agriculture.

All communications should be addressed to

The Federal Board for Vocational Education, Washington, D. C.

* Emergency war training for conscripted and enlisted men.

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BULLETIN No. 28

**HOME ECONOMICS
SERIES No. 2**

HOME ECONOMICS EDUCATION

ORGANIZATION AND ADMINISTRATION

▼

**ISSUED BY THE
FEDERAL BOARD FOR VOCATIONAL EDUCATION
WASHINGTON**

February, 1919

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1919**

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FOREWORD.

By the provisions of the vocational education law, enacted February 23, 1917, the Federal Board for Vocational Education is charged with the duty of disbursing Federal moneys to the States for approved instruction in home economics for persons over 14 years of age and of promoting in cooperation with the States the establishment of day, part-time, and evening schools.

This study has been prepared by Miss Josephine T. Berry, assistant director of home economics education, and revised by Miss Anna E. Richardson, acting assistant director of home economics education. This bulletin is published by the Board in order to supply information and suggestions concerning the organization and administration of home economics schools and classes under the Federal law. In fact, this bulletin may be considered as an official answer to the many inquiries concerning matters of policy in home economics education received by the office of the Federal Board since its organization in July, 1917.

C. A. PROSSER, *Director.*

PART I.

GENERAL PROVISIONS OF THE VOCATIONAL EDUCATION ACT.

PURPOSE OF THE ACT.

The underlying purpose of the vocational education legislation is the production of a nation of trained people and the increase in the number of skilled workmen. Hence, the vocational education law proposes a program for the promotion of certain forms of vocational education not now adequately provided for in our systems of education. These forms are: Vocational education in agriculture, in trades and industries, and in home economics. Since our systems of public instruction are under State control, the National Government proposes that the carrying out of this program shall be entirely a co-operative matter in which the Federal Government and the State governments assume definite responsibilities. The program outlined in the act calls for (1) the establishment of instruction in agricultural, industrial, and home economics subjects in schools and classes; (2) the preparation of teachers of these subjects; (3) the making of studies, investigations, and reports which will aid the States in establishing such vocational schools and classes.

PROVISIONS OF THE ACT.

The provisions of the act include the granting of Federal appropriations to the States for specific purposes and under specific conditions; and the terms of the cooperation between the Nation and the State under which this joint undertaking may be established and carried on. The terms of this cooperative agreement include the establishment of administrative machinery for carrying out the provisions of the act and a plan which specifies the work which the States propose to undertake in forwarding their program of vocational education under this act.

DISTRIBUTION OF FUNDS.

The Federal aid granted by the act is appropriated in three large ~~funds~~: (1) For the payment of salaries of teachers, supervisors, or directors of agricultural subjects; (2) for the payment of the sala-

ries of teachers of trade, home economics, and industrial subjects; and (3) for the preparation of teachers of agricultural, industrial, and home economics subjects. Each fund amounts to a little more than half a million dollars for the year 1918-19. Each fund increases annually to a maximum appropriated annually thereafter. The maximum for both funds appropriated for the salaries of teachers is reached in 1926, and is about \$6,000,000. The maximum for the teacher-training fund is reached in 1921, and is about \$1,000,000. These funds are allotted to the States according to population. The fund for agricultural education is allotted on the basis of rural population. The fund for trade, industrial, and home economics education is allotted on the basis of urban population; and the fund for the preparation of teachers is allotted on the basis of total population.

ADMINISTRATIVE MACHINERY.

The administrative machinery established by the act consists of a Federal Board for Vocational Education, and a State Board for Vocational Education in each of the States.

The Federal Board for Vocational Education is appointed by the President. Its seven members are the Secretary of Agriculture, the Secretary of Commerce, the Secretary of Labor, United States Commissioner of Education, a representative of manufacturing and commercial interests, a representative of agricultural interests, and a representative of labor. The Federal Board is empowered to cooperate with the State boards in the administration of the provisions of the act. Federal and State Boards each have a definite responsibility. The Federal Board represents the National Government and is charged with the responsibility of seeing that both the letter and the spirit of the law are complied with. This responsibility is discharged in large part through approval of plans submitted to the Federal Board by each State board for carrying out the provisions of the act and through the inspection of the work carried on in each State under these plans.

The State Board for Vocational Education, which must consist of not less than three members, is created or designated by the State legislative authority. This board may be a State board of education, a State board administering any form of vocational education, or a new board, as the State authorities elect. The State board represents the State government and is charged with the responsibility of making plans for the work of the State which are in accord with the terms of the act and adapted to the resources and the vocational needs of the State. This responsibility involves, further, the designation of the institutions to undertake the work, supervision of the work in progress, and an annual report to the Federal Board. These respon-

sibilities vested in the State board safeguard the autonomy of the State in the management of its educational affairs.

The State plan sets up the conditions under which the State proposes to carry out its program of vocational education under the vocational education act. The plan should show, first, the scheme for the administration of the act in that particular State; second, the acceptance of the general conditions under which the funds are to be expended as set forth in the provisions of the act; and third, the full description of the kinds of vocational work to be undertaken. The plan submitted by a particular State, when approved by the Federal Board, becomes the working agreement upon the basis of which the vocational activities of the State are carried on.

The administration of the act in a particular State is in the hands of the State Board for Vocational Education and its representatives. The State board is charged with the responsibility of cooperating with the Federal Board in the promotion of vocational education in the State and with the responsibility of disbursing Federal (and State) funds to schools which meet certain specific requirements and conditions. A State board can perform this double task of promotion and inspection only through representatives who are qualified by training and experience to advise and assist, to inspect and suggest, to approve and disapprove, to encourage and stimulate in these special vocational fields.

The provisions of the law as it relates to the Federal money which may be used for reimbursement to the States are of two groups: General provisions common to the three forms of vocational education, and special provisions for industrial education, including home economics education.

GENERAL PROVISIONS OF VOCATIONAL EDUCATION ACT AS THEY RELATE TO HOME ECONOMICS EDUCATION.

1. *Such education shall be given in schools and classes under public supervision and control.* This provision is a guiding principle of this legislation, an application of a fundamental principle of educational philosophy to the proposed system of vocational education. Education is a public concern. Our systems of education are supported by public taxation and controlled by the public for the public. Hence, those forms of education which are an extension of our system of public education, if they are to be supported by Federal and State taxation, must likewise be supervised and controlled by the public. Every educational activity promoted under this act must be under public supervision and control.

2. *That the controlling purpose of such education shall be to fit for useful employment.* This provision constitutes a definition of

vocational education in terms of its dominant aim—to fit for useful employment. In these words is set up the fundamental difference between general education and vocational education—general education designed to meet the needs common to all, vocational education designed to meet definite vocational and educational needs of special groups. Vocational education is built upon the foundation of the general education of the elementary schools and seeks to provide special preparation for special occupations, specific training for the specific job.

Home economics education may be defined as that form of vocational education which has for its controlling purpose the preparation of girls and women for useful employment as house daughters and as homemakers engaged in the occupations and the management of the home.

Preparation for useful employment in trades and industries implies preparation for a definite wage-earning trade and industrial occupation. Preparation for useful employment in home making implies special preparation for employment in an occupation which is a composite of undifferentiated occupations requiring various forms of skill and of related knowledge. Such employment may or may not be wage-earning employment. It is wage-earning employment for household assistants. It is not wage-earning employment in the general acceptance of the term, for home makers, who are at the same time workers and managers in their respective enterprises. As such they have need for forms of vocational education specially adapted to meet their needs, both as workers and as managers.

Further, preparation for employment in a specific occupation commonly implies immediate employment in the occupation at the end of the period of training. This condition holds for house daughters, for household assistants, and for home makers already in the service; but vocational training for home making is, with the larger number of our young women, preparation for a vocation in which employment is fairly certain but deferred. Estimates based upon the census of 1910 indicate that more than 80 per cent of our women marry and that 90 per cent of housewives do their own work. Again, vocational instruction in home making may be at the same time prevocational training for those specialized occupations which have grown out of the household occupations. As such it may serve as a means of discovering aptitudes and affording some preliminary preparation for such skilled trades and occupations as dressmaking, millinery, catering, housekeeping, and practical nursing.

3. That such education shall be of less than college grade and shall be designed to meet the needs of persons over 14 years of age who have entered upon or who are preparing to enter upon employment.

and justification for this provision as it relates to home eco-

nomics education are found in the following facts: Large grants of Federal and State aid have been made for vocational education of college grade in agriculture and mechanic arts, including home economics. Vocational education in home economics of a high order is being maintained in land-grant colleges and in other colleges. There is a growing tendency in this country to regard the State as responsible for the educational welfare of the child for a period after 14 years of age. There is also a growing conviction that the State should be responsible for providing vocational training for all persons desiring or needing such training. Practically all women need, and large numbers desire, vocational training for home making. Further, the girls and women needing or desiring such education are of the two groups indicated in the provision—those who have entered upon employment in the occupations of the home and those who are preparing to enter upon the work of the home.

By far the larger number of those who have entered upon employment left school as early as they were permitted to do so—usually at 14; certainly by 16 years of age. The greater number of those over 14 remaining in school are between the ages of 14 and 18. Therefore, vocational education which is suited to the age and educational needs of these groups would necessarily be education of less than college grade. For some this would mean vocational education of secondary grade based upon completion of the elementary school; for others it would mean vocational education for girls over 14 years of age who have not completed the elementary grades, and would be based upon the educational experience of the fifth or sixth grade.

This interpretation would make way for the organization of vocational day schools, classes, and departments open to girls 14 years of age who have not completed the elementary schools as well as to girls who are in secondary schools. It is undoubtedly the intent of the law to provide for vocational education suited to girls of over 14 years of age—not necessarily of secondary school grade. Furthermore, it is the experience of the States maintaining vocational education in home economics that girls of less than 14 years of age are seldom of the size or maturity to enable them to profit adequately from instruction of the vocational type. Hence the admission of younger girls to classes designed for girls of 14 years of age or over should be discouraged. If girls less than 14 years of age are admitted to such classes it must be clearly shown that they are mentally and physically fitted to carry on the work designed for the older girls.

Every dollar of Federal funds must be matched by a dollar of State or local funds, or both. As has already been stated, the terms of the cooperative agreement require that both State and Nation

shall invest in the enterprise undertaken within a State; in other words, that each Federal dollar be matched by a dollar appropriated by the State or local community, or both. The granting of Federal aid upon these conditions has become a national policy. In the States making grants of State aid for vocational education a similar principle has been followed. Federal aid is granted for the purpose of assisting the State or community, or both, to carry on the desired enterprise. Financial responsibility on the part of the State and community prevents officials from embarking on the enterprise without the support of the community; hence does much to insure the success of the undertaking. It is a well-understood fact that communities value more highly undertakings in which they are making an investment. The sense of ownership which a financial responsibility confers paves the way for greatly increased investment on the part of the State and local community as the enterprise grows, and insures public interest and pride in the undertaking.

5. *Federal money is to be expended only for—*

(a) *Reimbursement in part for salaries of teachers.*—Federal moneys from the funds for salaries of teachers of trade, industrial and home economics subjects may be used in so far as home economics is concerned only for reimbursement for part payment of salaries of qualified teachers. The qualifications of these teachers are to be specified in the plan proposed by the State board to the Federal Board as a working agreement for that State. It will be noted later under the discussion of qualifications of teachers what kind of vocational teachers are to be considered in State plans as eligible for reimbursement.

(b) *Reimbursement for expenditures incurred in the maintenance of the training of teachers of vocational subjects.*—Moneys from the Federal fund for teacher training may be used in so far as home economics is concerned only for the maintenance of courses for the preparation of vocational teachers of home economics. In cases where teacher training is maintained directly by the State board, expenditures may be made for the maintenance of such teacher training in equal payments from State and Federal funds rather than by making reimbursements from Federal funds for expenditures already incurred.

In this connection it should be noted that State boards have been authorized by a ruling of the Federal Board to use teacher-training funds for the maintenance of teacher training and supervision on the following conditions:

(1) That a plan of supervision be set up by the State board and approved by the Federal Board.

(2) That the qualifications of supervisors be set up by the State board and approved by the Federal Board.

(3) That all supervisors employed in connection with supervision, for the maintenance of which Federal funds are used, shall meet the qualifications set up by the State board and approved by the Federal Board, and that such supervisors shall be employed by and be responsible to the State Board for Vocational Education.

(4) That not more than 25 per cent of the maximum which may be used for teacher training in any one of the three lines—trades and industries, home economics, and agriculture—be used for the maintenance of supervision in that line. In other words, 15 per cent of the total amount of Federal funds available for teacher training within a State may be used for maintenance of supervision in home economics.

This is with the understanding that a large part of supervisory work is a training of teachers in service or itinerant teacher training. It should therefore be shown in the plan for supervision that such teacher-training work is included as a part of the State supervision scheme, and that the persons engaged in this work shall meet the qualifications necessary for this phase of supervision.

PART II.

SPECIAL PROVISIONS OF THE VOCATIONAL EDUCATION ACT RELATING TO HOME ECONOMICS EDUCATION.

The provisions of the vocational education act which have been discussed up to this point are general provisions, in that they affect all three phases of vocational education; namely, agricultural education, home economics education, and trade and industrial education. It is to be noted, however, that home economics education is identified in the further provisions of the law with industrial education rather than with agricultural education, and that the special provisions of the bill applying to home economics education are provisions which apply also to trade and industrial education. These special provisions define the conditions under which work may be set up in three kinds of schools; namely, (1) all-day schools, (2) part-time schools, (3) evening schools. In the following discussion these provisions are considered from the standpoint of home economics education only.

The fundamental distinction between home economics education and certain forms of industrial education for women's trades inheres in the occupations themselves. As has been stated before, home making is a composite of undifferentiated occupations requiring various forms of skill and of related knowledge. The wage-earning occupations, such as dressmaking, catering, practical nursing, millinery, etc., are specialized occupations requiring a high degree of special skill in one field, together with related knowledge in that field. The aim of home economics education is preparation for the work of the house daughter, home maker, or household assistant employed in this composite vocation. The aim of above forms of industrial education is preparation for wage earning in these specialized occupations. Distinctions between home-making schools and industrial or trade schools for girls may be made upon the basis of (1) the aim of the instruction; (2) an examination of courses of study as adapted to the preparation for the composite vocation or for a specialized vocation; (3) the material and methods of instruction employed, and (4) the relation of the instruction to later employment.

I. ALL-DAY SCHOOLS.

Types of all-day schools.—All-day vocational schools are organized either as (1) separate schools, or as (2) departments in schools.

1. *Separate vocational schools of home economics.*—In general, the separate vocational home-making schools have a teaching staff and offer a program of work entirely separate and distinct from the ordinary grade or high schools. There is but little articulation with the other phases of work of the school system. The courses offered are usually two years in length, although a few schools offer four-year courses. In many of the schools there is a classification of the girls upon the basis of previous educational experience, with exceptions to such classification carefully made for individual cases.

In many of these schools half the day is devoted to instruction and practice in home economics subjects, while the remainder of the day is devoted to instruction in related subjects and in academic or nonvocational subjects.

In addition to home-making courses, provision is sometimes made in these schools for instruction in such trade work as power-machine operating, designing, millinery, dressmaking, etc. There exists some confusion of ideas as to the differences between home economics education and industrial education for those women's trades which have grown out of the household occupations. This is partly due to the including of trade-work and home economics instruction in the same schools, but more generally due to the fact that clear distinctions have not been made between home economics education and certain phases of industrial education.

2. *Vocational departments of home economics* are in a few cases maintained in connection with grade schools, but more often with high schools. Such departments of home economics offer a program for a half day of vocational subjects which may be made up either entirely of home economics subjects or of home economics and related subjects. The remaining half day is devoted to nonvocational subjects. The vocational courses are from one to four years in length, are a part of the high-school curricula, and are accredited for high-school graduation.

Adjustment of the work of such a vocational department to meet the needs of the girls over 14 who have not completed the elementary school may be made by organizing them for separate classes in vocational subjects and permitting them to spend the other half day in grade work in the elementary school.

In larger cities separate vocational departments of high schools may be, in effect, separate schools, offering a complete program of vocational subjects, including home economics subjects and related subjects as well as nonvocational subjects, planned without any con-

cessions to the organization or work of other departments of the high school. In such separate vocational departments adaptation of the work to the educational experience and vocational needs of the girls may easily be accomplished through the organization of a more elementary course for the girls who have not completed the elementary school. Such a course would include home economics courses of a somewhat more elementary character and related and nonvocational subjects of elementary grade.

CONDITIONS AND STANDARDS SET UP BY THE VOCATIONAL EDUCATIONAL ACT WHICH APPLY TO ALL-DAY SCHOOLS OR CLASSES.

AGE OF ADMISSION.

The minimum age required for admission to vocational all-day schools is 14 years. Home economics instruction may be given either in the upper grades of the elementary school, in the high school, or in separate schools or classes, provided the instruction is designed to meet the needs of persons over 14 years of age.

PLANT AND EQUIPMENT.

The plant and equipment for adequate instruction in a course of study planned to provide training in home making would include suitable space and equipment for three groups of subjects: Home economics subjects, related subjects, and nonvocational subjects. In separate schools provision must be made for classrooms, supplies, and illustrative material suited to the nonvocational subjects and to the vocational subjects. Instruction and laboratory practice in home economics subjects and the related art and science subjects require special equipment, illustrative material, and supplies. Where the home economics course is a department of a school, the usual provisions made for classrooms, laboratories, and equipment can be made to satisfy the needs of the nonvocational and the special related subjects courses. If this is not the case, however, special provision in the way of space and equipment must be made for them.

The plant and equipment essential for adequate instruction in vocational subjects would include provision for instruction and laboratory practice in all the home activities which are taught within the school, such as housekeeping, garment making, dressmaking, food study and cookery, the serving of meals, laundry, home nursing, and the care of children. Careful selection of equipment is a more important factor than the amount of money expended. The necessary amount of space and equipment will vary with the number of pupils and the length of the course offered. The minimum equipment should include one workroom or laboratory with sufficient and

suitable equipment for instruction and practice in food study and cookery, including the serving of meals; one workroom or laboratory, with necessary equipment and supplies for instruction and practice in dressmaking, textiles, and the study of clothing, equipment for instruction and practice in laundry work, in housewifery, and in home nursing.

When, however, the classes are small, or as a temporary adjustment, one large room, approximately 24 by 36 feet in size, may be arranged for instruction in cooking at one end and instruction in sewing, serving of meals, and recitation work at the other, provided the equipment is adequate and the room is never used at the same time by classes in both sewing and cooking.

It is highly desirable that the equipment include a dining room, with suitable furnishings. Housekeeping rooms or an apartment add greatly to the interest and to the vocational value of the instruction in nearly all the vocational courses, and are found in a few of the best-equipped schools.

Manifestly, a house or apartment provides the most desirable form of equipment for instruction in housekeeping; but in lieu of either of these, the kitchen laboratory, with its equipment, the dining room and its furnishings, the school sewing room, and the office or library of the school building constitute a fairly satisfactory substitute. All instruction in housekeeping operations conducted in the school should be supplemented by special projects outlined to provide home experience for the pupils.

School kitchen.—The room used for food study and preparation must provide for individual laboratory work in cooking, opportunity for group work, and facilities for group instruction and recitation, as separate periods for laboratory and recitations are not desirable. This topic is developed under methods of instruction.

Two types of laboratory equipment designed to provide these facilities are the unit laboratory desk equipment and the unit kitchen. In the best laboratories of the first type each pupil has a table with a work surface of about 2 feet by 2 feet 6 inches, utensils of moderate size, gas or oil burners, or a share in a stove, an oven, and the conveniences of a sink. In the second type the floor space is divided into small kitchens, units equipped as average size family kitchens in which from two to five students work. Neither type unmodified serves all of the needs. The unit kitchens do more nearly approximate home conditions, but the usual arrangement makes no provision for group instruction and recitation. The unit laboratory desk economizes space and ordinarily allows for the grouping of chairs in relation to a blackboard, or where this is not possible, they themselves with stools and drawboards may serve

as desks. When the laboratory desks are used they should be supplemented by one or more unit kitchens where group work may be done, and where for a definite period each student may have the opportunity to work independently in a kitchen equipped and arranged to approximate home conditions.

Where the unit kitchen is used a classroom should adjoin the laboratory, or an alcove with chairs should be arranged where, without loss of time, the students may be gathered for directions, instruction, and recitation work.

Serving meals.—The equipment needed for serving meals consists of tables, chairs, table linen, table silver, and dishes. It adds greatly to the interest and value of the work when a dining room is provided for this purpose. If, however, no separate dining room is available the serving of meals may be taught in the school kitchen if space is provided where a table and chairs may be placed.

Sewing.—The essentials of a laboratory provided for instruction in garment making and dressmaking are: Sufficient floor area, ample storage, good lighting, work-table space, about 2 by 3 feet per pupil, drawers or lockers for materials, low comfortable chairs, sewing machines (one for three or at most four pupils), paper roll, dress forms, large mirror, and small supplies such as yard stick, tape lines, large shears, etc.

Home nursing.—The equipment necessary for instruction in home nursing is portable equipment. If the school equipment includes an apartment, a bedroom and bathroom of the apartment may be utilized as the ideal laboratory for the lessons in home care of the sick. In most schools, however, this is not possible. Portable equipment, including beds and bedding, sick-room appliances such as thermometers, back rests, bed trays, screens, hot-water bottles, etc., may be used in a classroom or in either of the laboratories already described. Such equipment may often be borrowed from a local hospital or from a shop which handles such supplies.

Laundry.—The equipment essential for instruction in laundry work includes tubs (preferably stationary tubs), a wringer, a hand-power washing machine, a power washing machine of the type suited to the power available in the community, irons, ironing boards, and small supplies. Stationary tubs can readily be placed under the drain boards of the sink in the foods and cookery laboratory and connected with the main drain if the drain boards are hinged so that they may be raised when the tubs are in use. Both hand-power and power machines can easily be borrowed for the period of the lessons in laundry work if they can not be provided in the permanent school equipment. The lessons in washing clothes may be conducted in the foods and cookery laboratory. Since the clothing

laboratory will commonly include electrical connection for electric irons, or at least provision for pressing, it is frequently found to be the most convenient place for conducting the lessons in ironing.

Reference material.—The collection of reference material will include a few of the best books dealing with each topic, a carefully selected list of magazines devoted to home economic subjects and free bulletins published by the Federal or State Government or by other agencies. In some States the library association lends to schools for the entire year libraries which has been selected by the teacher of home economics.

Illustrative material, including educational exhibits and samples of various products should be carefully selected and so preserved and arranged that they are available for use. Much of this material should be collected with the help of the class. This will serve to keep it up to date and increase its usefulness to the students.

Location of rooms.—The first floor is the best location for home economics laboratories, particularly the cooking rooms, because of the convenience of obtaining supplies and disposing of waste. In no case should basement rooms be used unless they provide all of the essentials of healthful conditions for work. The essentials are adequate space, light, ventilation, control of temperature, and a suitable location in relation to the other rooms of the school building. A concrete floor should be covered to protect students from the strain of standing upon the hard surface. For the cooking room a corner location with windows opening near the ceiling is best. The room should contain a flue for a range if wood or coal is used commonly in the community. The sewing room should be lighted from one side and a north exposure is preferable so as to obtain the strongest light.

The cost of equipment for 16 to 20 students ranges from \$400 upward. The cost is reduced when the manual training or industrial department makes the furniture and installs the plumbing, as has been done in a number of schools, and when use is made of dormitory rooms or homes for a portion of the work. A very modest equipment can be used for a one-year's course to which additions may be made as the course of study is extended.

MAINTENANCE.

Minimum maintenance standards are difficult to establish. This difficulty has been increased by the enormous variety in the prices of supplies used in home economics laboratories. State boards, therefore, have found it expedient to include in their plans only the statement that the maintenance shall be adequate to accomplish acceptable results.

Teacher's salary.—There is only a small amount of money available for home economics education under the vocational education

act, so only a few schools can be reimbursed to any considerable extent. The endeavor should be not so much to establish a large number of schools as to establish a type of school or class which will aid in developing the home economics work of the State. One or two types of good vocational home economics schools or classes will be more valuable in the educational development of a State than a dozen mediocre courses. The teacher must be well qualified. She should be chosen from the best teachers of home economics in the State, or, if necessary, teachers from other States may be employed. She must be paid an adequate salary. Well-trained teachers are so much in demand that only by paying a good salary can properly qualified teachers be secured. Some State boards have adopted the policy of requiring that the schools shall pay a salary to the home economics teacher slightly higher than the average salary in the State in order to insure getting a good instructor. Others are employing the home economics teacher for 12 months. In this way they are able to offer larger salaries and secure the services of the teacher during the summer months.

Supplies for laboratory use.—The cost of maintenance is very little in a course in clothing and garment making, because in such courses the students furnish the material upon which they work or the materials are supplied on the basis of "order work" and the department is reimbursed for all materials from the sale of the garments.

The cost of maintenance is small for courses in home management, home nursing, house planning and furnishing, because few supplies are needed for the effective carrying out of a lesson.

The cost of maintenance of courses in food preparation vary somewhat with localities and the size of the classes. The minimum cost of maintenance for a class in food preparation meeting five times a week has been found to average \$8 to \$10 per student per year.

Methods of decreasing the expense of maintenance.—The disposal of food products to a lunch room, the management of a lunch room, food sales, the taking of orders for articles of clothing selected because of their value in the course, are devices which have been used successfully to decrease the cost of maintenance. The cost of maintenance should not be decreased by any means detrimental to the educational value of the work. The preparation of school lunches involving excessive repetition of simple processes, the making of garments, where the quantity of the production is considered rather than the student's development, and other similar procedures, should be avoided.

Educational values of work on a productive basis.—There is a distinct educational value and gain in interest from doing work on a productive basis, and the class problems should all have as their aim the production of a product which can be used. This is fairly simple

in clothing work, but a plan should be devised by which the products from the school kitchen are used. Part should be reserved for samples and comparison, but the remainder should either be used for the lunches of the members of the class or disposed of in some other way. It is a waste of materials to have the food consumed at odd times in the laboratory or tasted and thrown out, as is too frequently the practice. When the product from the classes in foods and cookery can be sold in the lunch room or in food sales, and when at the same time the sequence of problems can be determined by the educational and vocational needs of the class—not by what can be sold—such an arrangement should be made. This plan improves the technic and adds interest to the work.

The commercial project carried out definitely as a commercial project, in which for a certain time the work of a class consists in assisting in the preparation of food for the cafeteria, or with food sales or with catering, is of considerable educational value. The project should result not only in giving more practice in food preparation, but also in teaching commercial standards; the necessary division of labor and group organization essential to carrying on the labor project; and the relative cost of labor and of materials in the commercial product. In short, work on a commercial basis should not only afford the pupil experience as a worker, but should serve as a means of giving some insight into business management.

COURSES OF STUDY.

Guide in planning course of study.—Home economics education demands special courses of study, appropriate methods of instruction, and special qualifications on the part of teachers. The guiding principles to be used in formulating such courses of study are certain established principles of vocational education, applied to the field of home-economics education. These are: (a) The controlling factor in determining the subjects to be included in the course of study designed as preparation for an occupation must be the vocational needs of the persons who are to follow the occupation; (b) the central feature of such a course of study must be a group of so-called technical subjects designed to meet the special needs of the special group; (c) this group of technical subjects must be supported and supplemented by a group of related subjects; (d) certain subjects from general education are needed to complete a well-rounded course of study. These are denominated nonvocational subjects. A course of study designed for vocational education is, therefore, divided into three groups: Technical subjects, related subjects, and nonvocational subjects. The technical and the related subjects are together called vocational subjects.

In planning a course of study which will prepare for any given occupation, the vocational subjects to be selected should be determined by an analysis of the occupation. The first step then in determining the content of a course of study which will fit the student for the occupation of home making is an analysis of the occupation of home making. Home making has already been called a composite occupation. It is made up of a number of skilled but undifferentiated occupations. In addition to this, home making is both a social and a business enterprise. Under ordinary circumstances the efficient home maker must be a reasonably skilled worker in at least four or five skilled occupations. Under emergency conditions this number may be increased. In addition, she is usually joint owner and manager of the whole enterprise. Hence she must be skilled in household management. The duties of the home maker as a skilled worker and as a manager so overlap that they can not be entirely dissociated.

(a) *The home maker as a worker.*—The efficient home maker must be a skilled worker in general housekeeping. She must be a skilled worker in preparing and serving food. Her responsibilities as a seamstress and as a dressmaker are not as great as formerly, but it would appear that the services of the home maker as a seamstress for the remaking and the care and repair of clothing will continue to be an occupation essential in the average home. The care and rearing of children is the home occupation demanding the highest degree of skill and acknowledged to be the most important one of all. As yet, however, it is the least emphasized in our plans for vocational education. The care of the health of the family is also largely the responsibility of the home maker.

(b) *As joint manager, the home maker* is responsible for the character of her enterprise and the standard of living, and for the product which the home will turn out. She is the purchasing agent, a partner in the business, and usually the business manager. As such she must budget the family expenditures and keep the household accounts. As the superintendent of the plant, she plans her own work, the work of the members of her family, and, when she has them, the work of employees. She is the educational manager, the health and welfare manager, and the social manager of the family group.

This analysis is given in order to make clear the dual character of the qualifications and the responsibilities of the home maker; hence the dual service which the training must give. Manifestly, the vocational needs of home makers and house daughters are skill in the household occupations and knowledge essential to efficient management of the home. A course of study designed to meet these needs must therefore provide for instruction and practice in the

home occupations and in the fundamental arts and sciences upon which the home occupations are based so that the home maker becomes an intelligent workman who understands the scientific principles underlying the simple home processes. This analysis of the home-making occupations shows the needs of these two groups of subjects as a part of the curriculum of home making—the technical or home economics subjects and the related art and science subjects which supplement and strengthen the technical work, and which together are called vocational subjects.

Program for vocational course in home economics.—It is clear, therefore, that a vocational course in home economics must provide instruction in the various occupations of home making, instruction in art and science as applied to the home, and instruction in non-vocational subjects.

The law provides that schools or classes giving instruction to persons who have not entered upon employment shall require that at least half of the time of such instruction be given to practical work on a useful or productive basis.

This provision was drawn up with particular reference to training in trade and industry. Since the conditions are not exactly the same for home economics education, it was necessary for the Federal Board to make an interpretation of this provision as it relates to home economics education. Under this interpretation, "practical work on a useful basis" is held to mean instruction in vocational subjects designed as preparation for home making. These subjects are of two groups, (1) home economics subjects, and (2) related subjects. (1) Home economics subjects include garment making, textiles and dressmaking, millinery, foods and cookery, sanitation and home nursing, house planning and house furnishing, and home management. Instruction in these subjects will include the actual handling of materials in laboratory practice, as well as supplementary instruction in food values, selection and care of clothing, etc., and the application of scientific principles essential to the laboratory work. (2) Related subjects include the arts and sciences which are fundamental to home economics, such as drawing and design when applied to clothing and the home, and chemistry, physics, and bacteriology when applied to the household. Instruction in these subjects will include material from the field of science or art selected, organized, and presented to meet the needs of students of vocational home economics and must be closely related and correlated with the instruction in home economics subjects.

Hence, the program for the vocational half day of home economics may consist either of home economics subjects; or of home economics subjects and of related subjects; according to the needs of the group

to be taught. In either case the pupils pursuing the course of study in vocational home economics must be grouped separately for this half day of instruction. There are thus set up two general programs for the half day of practical work:

1. The half day of practical work devoted entirely to home economics subjects.
2. The half day of practical work devoted to instruction in home economics subjects and related subjects.

In program No. 2, if the school program is six hours in length, not less than 120 minutes of the half day or 10 hours weekly shall be devoted to home economics subjects; and the remainder of the half day shall be devoted to instruction in related subjects. In the State plan both programs 1 and 2 should be included as the programs for vocational home economics in day schools, the choice of one plan or of the other being made by each school or community according to the needs of the group to be reached.

The vocational education act provides that for cities of less than 25,000 population the State board, with the approval of the Federal Board, may modify the conditions as to length of the day and length of the term. In making such modification the number of hours of instruction per week should in no case be less than 25, nor the hours of instruction per day less than 5. In the five-hour day at least one-half the day, or 150 minutes, must be devoted to instruction either (1) in home economics subjects, or (2) in home economics subjects and related subjects. If the program of the vocational half day includes both home economics subjects and related subjects, not less than 90 minutes of the half day shall be devoted to instruction in home economics subjects, and the remainder of the half day to the related subjects.

I. Program for the half day of practical work given entirely to home economics subjects.—In the schools where the program for the half day is given entirely to home economics subjects the course ordinarily covers one to two years. These classes are usually organized for students who will in all probability stay for only one or two years of work. Some of these students go directly into the work of their own homes as "Little Mothers," house daughters, or as home makers, while others seek employment in the trades, and for these the vocation of home making is more deferred.

Content of course.—Such a course should be planned so that as far as possible the essentials of home making are taught. The half day, or 180 minutes, should be devoted to the study of clothing and garment making, food study and cooking, home management, including household accounts, home sanitation and home nursing, and child care. The other half day should be devoted to the essentials in re-

lated art and science, together with English, civics, and history. The two years should be a unit made up as far as possible of two complete years. The same subjects may be pursued in each year, but the choice of subject matter and treatment will involve a larger content and progressive difficulty, so that the student is encouraged to stay for the more advanced course. For certain groups it may be practicable to extend the course of study for three or four years, the third and fourth years dealing with the more advanced phases of dressmaking, millinery, house furnishing and decoration, lunch room and cafeteria cooking, as well as the advanced work in related subjects.

II. *Program for the half day of practical work made up of home economics subjects and related subjects.*—This is the program which more generally meets the needs of the majority of the girls over 14 years of age who remain in school. Such a program may be from one to four years in length. When the work is new in a school it is often advisable to start with a one or two years' course and build it up. In the small school it is often expedient to have the first and second year students and the third and fourth year students grouped together for instruction. By proper planning, the four years of work may be so given at much saving of time and energy.

Content of course.—The half day, or 180 minutes, should be devoted to home economics subjects and related art and science subjects. The home economics subjects given will include garment making, textiles, dressmaking, millinery, food study and cooking, elementary dietetics, home management, child care, and house planning. The related subjects will include applied art and design, costume design, house furnishing, general science as applied to the household, physiology, including hygiene and home nursing, household physics, and chemistry.

The subjects given in any course will depend upon the number of years of work to be offered and the previous training of the students.

SEQUENCE OF COURSES.

The sequence of these courses will depend very largely upon the work given in the elementary grades. Home economics is being given more generally in the grades, and such work must be encouraged. When the students have had some home economics in the grades, the home economics given in the secondary school must be planned to correlate with and build upon the instruction which pupils have already had. In many cases, however, the vocational work must be designed to meet the needs of groups having no previous instruction in home economics.

In planning the vocational courses in home economics it is important to keep clearly in mind that the related subjects, art and science, form an essential part of the program and must not be chosen from the viewpoint of the most satisfactory scheduling of courses, but must be chosen with the realization that the work in the related science and art is fundamental to a clear understanding or a wide application of the home economics instruction. Therefore, in the ideal course, art and design should be given parallel with work in textiles, garment making, dressmaking, and millinery. This is true both in the elementary work and in the more advanced courses. In like manner, applied science should be given parallel with the work in food study and cooking, home nursing, dietetics, home sanitation, and home management.

There are a variety of satisfactory ways in which the courses of study may be planned, the sequence again depending upon the previous experiences of the group of students, the teaching staff, equipment, etc. If the first year's work in home economics is food study and cooking, the related work should be science as applied to home problems. The following year's work should be the study of clothing and its construction and elementary home management, and should be correlated with art and design and applied science. If the first year is made up of a semester of food study and cooking and a semester of garment making, or if the two are given throughout the year, the science and art should, if possible, be given as parallel courses with the food and clothing work. Similar relations should obtain in the third and fourth years, the work in home economics, including more advanced problems in home making, and the related science and art supplementing these courses throughout.

There is no one course of study. The course is designed to train home makers. With this occupation clearly analyzed and the requirements of the law as it relates to the half day of practical work definitely understood a satisfactory course can be planned which will meet the needs of particular groups of students.

LENGTH OF COURSE.

The length of the vocational course will vary with the needs of the groups to be reached, the teaching staff and the available equipment. The course may be one, two, three, or four years in length. Whatever the length of the course planned, the student who drops out at the end of the first or second year should be considered and the course so planned that each year is a fairly well developed unit.

HOME PROJECTS.

Home project the real project.—In planning any course in home making it must be kept clearly in mind that the aim of the course

is to make it function in the home. The real project is the doing of a piece of home work in a real home, and no course in home making is complete that does not provide for home work either as a regular part of the home-making course or as summer work. We have not yet learned how best to plan and supervise such home work, yet to do so is at the present time a pressing need in vocational education for home making. A home project should offer experience in the occupations under the conditions of the occupations. It should involve a real problem, should provide for the repetition of previous practice and the application of knowledge gained to a more extended problem under conditions of lesser supervision and instruction, and hence should be the means of increasing skill and independence. The employment of the 12 months' home economics teacher will do much to develop home-project work, and she should be encouraged wherever such an appointment is possible.

TABLE SHOWING SEQUENCE OF COURSES AND RELATIONSHIP OF ART AND SCIENCE SUBJECTS TO HOME ECONOMICS SUBJECTS.

TEXTILES AND CLOTHING.

<i>Home economics subjects.</i>	<i>Related subjects.</i>
Textiles and garment making.	Drawing and design applied to clothing and the home.
Elementary dressmaking.	
Advanced dressmaking and study of clothing.	Advanced design, including dress design and house furnishings.
House planning and house furnishing.	

FOODS AND HOUSEHOLD MANAGEMENT.

Food study and cookery.	Household science (general science applied to the household).
Home management (including planning and serving of meals, household accounts).	Household accounts.
Laundry.	Sanitation, hygiene, and home nursing.
Elementary dietetics.	Household chemistry.
Child care.	Household physics.
Lunch room and cafeteria cookery.	
Home practice and home projects.	
In the school:	
Noonday lunch.	
Food sales.	
Junior Red Cross.	
Garment making, for sale, etc.	
In the home:	
Practice in household operations.	
Projects, including management.	

Nonvocational subjects.

English language and literature.
 Civics and citizenship.
 Elementary social science and economics.
 Mathematics.
 History.

OUTLINES OF SUGGESTED TYPE OF COURSES FOR ALL-DAY CLASSES.

I. TWO YEARS' COURSE OF STUDY IN VOCATIONAL HOME ECONOMICS, IN WHICH HALF OF THE DAY OR 15 HOURS PER WEEK IS DEVOTED TO HOME ECONOMICS SUBJECTS AND HALF OF THE DAY IS DEVOTED TO RELATED SUBJECTS AND NON-VOCATIONAL SUBJECTS.

FIRST YEAR.

<i>Vocational subjects.</i>	<i>General and related subjects.</i>
<p>A. Choice of:</p> <p>Garment making. Millinery. Textiles. Cooking and food study. Laundry. Total hours per week, 15.</p>	<p>A. Choice of:</p> <p>Literature. Arithmetic. History. Citizenship. English. Music. Physical training. Home nursing. General science applied to the home. Applied design. Hygiene. Total hours per week, 15.</p>

SECOND YEAR.

<i>Vocational subjects.</i>	<i>General and related subjects.</i>
<p>A. Choice of:</p> <p>Dressmaking. Millinery. Meal planning and serving. House planning and furnishing. Home management. Child care. Total hours per week, 15.</p>	<p>A. Choice of:</p> <p>Literature. History. Arithmetic and household accounting. Citizenship. English. Music. Physical training. Household chemistry. Applied design. Total hours per week, 15.</p>

II. COURSE OF STUDY FOR A SIX-HOUR SCHOOL DAY IN WHICH HALF THE TIME IS DEVOTED TO HOME ECONOMICS AND RELATED ART AND SCIENCE.

One, two, three, or four years of such a course may be offered. One-half day, or 180 minutes must be devoted to practical work. Of this time at least 120 minutes must be devoted to home economics subjects. To supplement this

not more than 60 minutes a day, or 300 minutes a week must be devoted to related science and art.

The subjects offered may be given five times a week throughout the year, or two subjects may be offered in alternate semesters or two subjects may be given alternate days throughout the whole year.

FIRST YEAR.

<i>Subject.</i>	<i>Time.</i>
English.....	5 periods.
Mathematics, history or elective.....	5 periods.
Home economics (garment making and textiles, food study, and cookery, or both.)	5 120-minute periods, or 600 minutes a week.
Related work.....	300 minutes a week set up as 5 60-minute periods or 3 45 and 2 90-minute periods.
(General science applied to the household, drawing and design, or both.)	

SECOND YEAR.

English.....	5 periods.
Mathematics, history or elective.....	5 periods.
Home economics.....	5 120-minute periods.
(Choice of elementary dressmaking, including clothing, budgets, home management, meal planning, household accounts, or both.)	
Related work.....	300 minutes per week may be arranged in double and single periods.
(Applied physiology, hygiene, and home nursing or applied design, or both.)	

THIRD YEAR.

English.....	5 periods.
Elective.....	5 periods.
Home economics.....	5 120-minute periods or 600 minutes per week.
(Choice of house planning and furnishing, clothing design, textiles, millinery, dressmaking, or combination.)	
Related work.....	300 minutes per week.
Household chemistry or Household physics.	

FOURTH YEAR.

English.....	5 periods.
Elective.....	5 periods.
Home economics.....	5 120-minute periods or 600 minutes per week.
(Choice of elementary dietetics, home management, child care, or a combination.)	
Related work.....	300 minutes per week.
Household physics or Household chemistry.	

III. COURSE OF STUDY FOR A FIVE-HOUR SCHOOL DAY IN WHICH HALF THE TIME IS DEVOTED TO HOME ECONOMICS AND RELATED ART AND SCIENCE.

One, two, three, or four years of such a course may be offered, in which one-half day, or 150 minutes must be devoted to practical work. At least 90 minutes

of this half day must be devoted to home economics subjects. To supplement this, not more than 60 minutes a day or 300 minutes a week must be devoted to related science and art.

FIRST YEAR.

<i>Subject.</i>	<i>Time.</i>
English.....	5 45-minute periods.
Mathematics, history, or elective.....	5 45-minute periods.
Home economics.....	5 90-minute periods.
(Garment making and textiles, food study and cooking, or both.)	
Related work.....	7 to 10 45-minute periods.
(General science applied to the household, drawing and design, or both.)	
	May be set up as 3 45 and 2 90-minute or 5 90-minute, depending upon the subject.

SECOND YEAR.

English.....	5 45-minute periods.
Mathematics, history, or elective.....	5 45-minute periods.
Home economics.....	5 90-minute periods.
(Choice of home management, including meal planning and household accounts, elementary dress making, or both.)	
Related work.....	7 to 10 45-minute periods.
(Applied physiology, hygiene, and home nursing, or applied design.)	
	May be 45-minute periods and 90-minute periods.

THIRD YEAR.

English.....	5 45-minute periods.
Elective.....	5 45-minute periods.
Home economics.....	5 90-minute periods.
(Choice of house planning and furnishing, clothing design, textiles, millinery, dressmaking, or a combination.)	
Related work.....	7 45-minute periods. May
Household chemistry or	
Household physics.	
	be 3 45-minute periods and 2 90-minute periods.

FOURTH YEAR.

English.....	5 45-minute periods.
Elective.....	5 45-minute periods.
Home economics.....	5 90-minute periods.
(Choice of elementary dietetics, home management, child care, or a combination.)	
Related work.....	7 45-minute periods. May
Household chemistry.	
Household physics or	
	be 3 45-minute periods and 2 90-minute periods.

HOME ECONOMICS AS A FORM OF VOCATIONAL EDUCATION.

The preceding statement of principles, together with the application of these principles in the building up of a course of study for

home economics education, indicates the fundamental difference between home economics education as a form of vocational education, and instruction in home economics subjects as a part of general education. Home economics education as a form of vocational education demands a well-rounded course of study directed to one main objective—the preparation of home-makers and house daughters. It is the central course in relation to which the entire program is planned. As a part of general education, the essential relations between home economics subjects and related subjects are seldom recognized; home economics is there considered merely one subject in a program of general subjects.

METHODS OF INSTRUCTION.

Vocational courses appropriate to the field of home economics education include those of the type known as laboratory courses, or courses in which the processes under discussion are actually worked out in the laboratory by the students. Ordinarily such courses are divided into laboratory and recitation periods. Such a division is to be avoided, as it is difficult to fit the material to be covered into such an artificial division of time. The work gradually becomes separated into theory given in the lecture or recitation and practice given during the laboratory period. This may result in a complete separation of these two phases of the work and even lead to their being given by different persons. A better plan is to set aside the requisite time for the work without any separation into laboratory and recitation periods. This time is then divided into laboratory practice, discussion, or directed study as the need for each is indicated, one growing out of the other and the whole standing together as a unit of instruction. In actual practice relative amounts of time spent on laboratory and recitation will vary, depending upon the needs of the course. The time spent on the recitation and discussion will average about one-third the total time allotted to the lesson.

Laboratory instruction is of two types.—In one type of laboratory instruction the mastery of the subject matter is the main purpose. The laboratory experiments are used chiefly as supplementary or illustrative material to aid in the mastery of the desired facts and principles. These experiments are artificial and have little relation to everyday life. The process employed in working out the experiment is, in itself, of little value and is of importance only as it serves as a means of teaching the desired facts.

In the other type, which we shall call the functional or project method, we have a different aim. It is to develop functioning individuals rather than to give information. This means that em-

phasis is laid on teaching a process rather than on giving subject matter. The course is organized around the processes which it is desirable that the student shall know in a given occupation. These processes take the form in which the student will meet them in everyday life. Informational material is of importance only as it aids in the working out of the process.

The first type of laboratory instruction is used quite largely by teachers of pure sciences, with "science for science's sake" as their aim. As the sciences come to be taught more from the point of view of their application we use the functional or project method of instruction. This method is to be preferred in teaching all home economics and related art and science courses.

The project method.—Applying the project method to vocational home economics, the course must be based on home-making problems and projects to be worked out under as nearly normal conditions of the home as is possible. The essential features of these home-making problems are:

1. They must be real problems occurring in the life experiences of the girls.

2. They must be of sufficient value to be an end in themselves as well as a means of instruction.

3. They must serve as a means of connecting the home and school experience of the girls.

4. They must be so selected as to give the practical training and knowledge that will arouse interest and prepare the girls for the varied responsibilities of the care and management of the home.

5. They should be selected so as to present projects of gradually increasing difficulty so as to enable the students to apply the knowledge gained in one problem in the working out of the next. This makes it possible for the students to work with a minimum of help and tends to the development of independence.

6. The projects must be selected so that as nearly as possible all the processes, information, and skill necessary in the home-making occupation are acquired.

Points which should be kept in mind in the handling of the project method.—Since the main purpose of such a course is to develop skill in the occupation of home making, especial care should be taken in all the work done to develop correct habits of work and skill in handling materials. In order to accomplish this, it is suggested that the teacher make a list of all habits of work and details of technic which are important and see that all of these are provided for in the projects.

The habits of work should be kept carefully in mind and developed in the laboratory from day to day. These may be personal habits

such as neatness of person and dress, tidiness of hair and hands, use of tasting spoon, or the more general habits of working neatly, planning and executing work systematically, maintaining proper position of body in sewing, etc. Most of these may be developed indirectly if proper attention is given to them each day by the teacher. If the list suggested above is prepared it will insure attention to such details as may otherwise be overlooked. The points to be noted and the relative amount of attention necessary will vary with the group of students.

Provision should be made for all essential details of technic.—This would include such work as the care and use of sewing machine, sweeping, dusting, handling stove, washing dishes, etc. Greater interest is gained if these technical processes are taught as a part of a problem than if separate and disconnected lessons are devoted to them. For example, the students may have little interest in learning how to build a fire in a wood stove if that is made the aim of the lesson, but much interest is centered in the building of the fire if it is a necessary step in the preparation of a dish. Such a list of technical details must be prepared in the light of the home conditions of the girls who are being taught.

Special drill lessons are needed in developing technic in the processes involved, but such lessons should not be provided until the student realizes, through actual failure in the execution of the process, the necessity for the development of this technic, and then it should be given in connection with the special problem requiring it. If, for example, the student is making a garment and needs to know how to make a buttonhole as a means of fastening, she is perfectly willing to stop for a drill on the buttonhole, for she realizes the necessity for constructing well made buttonholes, so that the garment may not be disfigured by poor workmanship. Drill lessons on models become mechanical, and the interest of the student is lacking.

A plan of work is necessary.—The student should be taught to think the problem through before starting to work. An occasional question from the teacher as to the proposed plan will indicate whether the student is thinking the problem through correctly and thus prevent, in case of incorrect solution, serious error and possible waste of time. If the student is not on the right track, a few skillful questions will often set her right and at the same time not interfere with her independence of thought. Information and direction should be given at the time when the student feels the need for them. Help must not be given to the extent of crushing out thought and initiative. Teaching by dictation—i. e., giving exact directions, printed recipes or rules—may seemingly economize time, but such

methods tend to make dependent rather than independent thinkers and workers. The teaching of what is often spoken of as "recipe cookery" and of "dictation sewing" lacks much of the possible vocational as well as educational value. The aim should be the development of independent workers. This means that definite directions should not be given for the working out of the problem, but that the problem should be clearly stated and an understanding of it assured by class discussion. The students are then put to work on the problem and guided in working out the correct solution.

Recitation and laboratory work together should lead to conclusions which are to be the basis of later practice in the occupation. For that reason each class exercise should be summed up through a discussion at the end of the class period or at the beginning of the succeeding class exercise. Whenever the class problem results in a definite product, either the class exercise or a later exercise must provide for an examination and an estimate of the quality of the product.

Use of logical reviews.—One objection to the project method has been that the information necessary for the successful carrying out of the processes involved is acquired in a choppy and unorganized form. This makes it difficult for the student to grasp that bit of subject matter as a whole and to see the relative importance of the different facts. Such a difficulty can be avoided by frequent logical reviews in which the subject matter is organized from the point of view of the subject studied. This also enables the teacher to supply any information which the student may need but which has not been covered by the projects selected.

Courses without laboratory work.—Certain of the home economics courses, such as house sanitation and house furnishing, are frequently offered without any laboratory work. In each of these there should be laboratory work on the project basis where the processes are such that they may be carried out or executed by the girls. The care of a first-aid room at school and the furnishing of a practice house are examples of such projects. In case these problems can not actually be executed by the students the material for such lessons may still be presented as a project, so that interest is added and the material is organized in the way in which it functions in home making. Such projects are called observation and report projects.

In the assignment of the lesson the problem is stated and discussed to be sure it is thoroughly understood. The problem should be definite and of interest to the students and the source of material available for its solution clearly indicated. Hypotheses are formulated, tested out, and the results reported during the recitation

period. These are compared and results generalized. Care must be taken during class periods to insure careful thought on the part of all the students and to prevent a few good students from carrying the work of the whole class.

Methods of instruction in related subjects, such as drawing, design, and applied science should follow, in general, the principles outlined above for the home-economics subjects. If a subject is to be related, we must select from the principles usually taught in that subject those which may be applied in home economics courses and they should be taught through projects involving their application. Supplementary experiments should be given in order to make more evident the application of the art or science to home economics.

QUALIFICATIONS OF TEACHERS.

The teachers needed to carry out the vocational education program for the promotion and maintenance of home economics education in the States are teachers of home economics subjects, teachers of related subjects, and teachers of nonvocational subjects. Standards for the qualifications of teachers of nonvocational subjects are the basis of fairly uniform systems of certification in all the States which make college graduation and specialization in one or more subjects taught in the field of secondary education as the general requirement for the certification of teachers of secondary nonvocational subjects. By the terms of the law, State Boards for Vocational Education are charged with the special responsibility of setting up standards for the qualifications of the teachers whose salaries may be paid in part from Federal funds. Under the interpretation of the Federal Board, Federal aid may be used for reimbursement of one-half the salaries of teachers of vocational subjects. It therefore devolves upon State boards to set up standards for the qualifications of teachers of home economics subjects and of related subjects to be employed in their respective States.

Teachers of home economics.—The demands of instruction in home-economics subjects are superior skill in the household occupations and an understanding of the significance and of the demands of the vocation of home making, knowledge in the field of home economics and in related fields of science and of art, and ability to teach, using the methods of instruction adapted to this form of vocational education. Such qualifications can only be secured through experience and through special preparation. They are, therefore, set up in State plans in terms of (1) practical experience, (2) training in home economics, and (3) professional training.

(1) *Practical experience.*—It is difficult to determine the amount and character of vocational experience necessary to develop the

degree and variety of skill essential to an appreciation of workmanship in the household occupations, and to furnish a basic fund of knowledge essential to a feeling for the occupation and to an understanding of its needs and responsibilities. Nearly all girls, and also nearly all boys, grow up in some sort of a home. Whether they participate in the household occupations or not, they have, at least, a superficial understanding of its needs and responsibilities. Moreover, a very large proportion of girls participate in the work of the home. It would, therefore, seem reasonable to assume that, as compared with industrial education, a shorter period of actual participation in the household occupations would be required to provide the necessary contact with the vocation. In this assumption it is understood that the participation in the occupation involves a wide variety of experience and all-around responsibility for management.

The States have, therefore, very generally set up as the qualifications for practical experience a requirement of two years' vocational experience, including a reasonable period of actual management of the home. This is understood to set up as a minimum the vocational experience of a house daughter who has shared the household duties and at least for a period of several months has had the responsibility for the management of the home. It is understood, of course, that experience covering a longer period, and involving a larger responsibility, is highly desirable; and that household experience, supplemented by business experience, constitutes a still more desirable equipment in the way of vocational experience.

(2) *Training in home economics*, which is accepted as the qualification for teachers of home economics subjects, is the course in home economics given in a 4-years' college course, designed to give special preparation for teaching the vocation of homemaking.

Such a course must be made up not only of technical work in home economics subjects, but these must be strengthened and supported by prerequisite or parallel courses in science and art. The home economics subjects in such a course include food study and cookery, dietetics, home management, house planning, textiles, dressmaking, etc., and the related science and art includes chemistry, physiology, bacteriology, drawing and design, etc.

In no case should a teacher qualify as a vocational teacher who has not had an all-round course in home making, even though the class work is so divided that only one phase of home making, clothing, or food preparation, is taught by each teacher.

(3) *Professional training* used in connection with the preparation of teachers is generally accepted as meaning a group of so-called professional courses—courses in education. In the case of students of home economics, this group of courses is not a part of the regular

home economics curriculum, but comprises the group of teacher-training courses offered for students who are preparing to become teachers. The courses offered as a basis for certification vary in the different States both in character and in extent. Everywhere, however, they include certain general courses in education, and special courses for special groups of students, together with the experience in teaching which is called practice or student teaching. In the way of professional training the legal requirements for certification vary in extent from 10 to 15 per cent of the total 120 credit hours constituting the college course. A recent examination of these statutory requirements indicates that 15 hours constitutes the average.

Teachers of related subjects.—The teachers of related subjects who are needed to carry out the program of vocational education in home economics are teachers of science as related to the home and teachers of art as related to the home. Such teachers should have not only a knowledge of the subject matter and the ability to teach it, but in addition they must have adequate contact with the vocation of home making and a familiarity with the methods of instruction which are best adapted to secure the essential correlations between the related subjects and the home economics subjects.

The training which will fit *the teacher of related subjects* for the demands of such work is grouped under: (1) Practical experience, (2) technical preparation in the special subjects, and (3) professional training for teaching.

(1) *Practical experience.*—The amount and character of the contact with the vocation of home making which is essential to successful teaching of related subjects can hardly be quantitatively estimated. It is certain, however, that sufficient contact with the household occupation is necessary to furnish a basis of understanding and of insight into the various household processes, and it is highly desirable that the teacher of related science or art have some of the college courses in home economics designed for the training of home makers. This assures an understanding of the fundamental relationship of the science or art to the home-making course.

(2) *Technical preparation.*—The technical science or art training required of the teacher of related subjects should not be less in amount and quality than that required by the State for the certification of a teacher of science or art. This is important if the training of related-subjects teachers is to be of an acceptable standard and the instruction satisfactory.

(3) *Professional training* for teachers of related subjects would include the same general courses in education as those required for teachers of home economics subjects, together with courses in special methods and student teaching dealing with related science or related art subjects.

Teachers of related subjects may be recruited from two groups of teachers: Teachers of science or of art who have the opportunity to secure contact with the vocation of home makers; teachers of home economics subjects who may take further preparation in related art, or in related science subjects.

In the small school where one teacher has charge of the home economics work, it is often desirable that she also teach some of the science or the art. In the larger school of several teachers it is more satisfactory either to have special teachers of science and art, or to so divide the instruction in home economics that one phase of home making, the clothing, is taught in connection with the art work, and the food study and preparation is taught by a teacher who is well prepared in related science.

II. PART-TIME SCHOOLS OR CLASSES.

CONDITIONS AND STANDARDS SET UP BY THE VOCATIONAL EDUCATION ACT WHICH APPLY TO PART-TIME SCHOOLS OR CLASSES.

The vocational education act provides for cooperation between the Federal Government and the States in promoting education for various groups of persons over 14 years of age who have entered upon employment and are released during regular working hours for instruction purposes. In practically every State there are available as possible pupils for part-time instruction large numbers of minors who have left school at the earliest age allowed by law, and entered upon employment. Some States have already established either compulsory or permissive part-time schools to provide for this group.

In accordance with the provision of the Federal vocational education act at least one-third of the fund for trade, home economics, and industrial education must be spent, if spent at all, in part-time schools and classes. This obligatory use of the funds makes it quite evident that Congress believed that part-time education needed promotion even more than other forms of industrial education. In interpreting the provisions of the act as they apply to industrial education, the Federal Board recognizes three types of part-time classes.

1. *Trade extension part-time schools or classes* are those giving instruction to persons who have entered upon the work of a trade or industrial pursuit. The purpose of this instruction is to further fit such persons for useful employment in the trade or industrial pursuit in which they are already employed.

2. *Trade preparatory part-time schools or classes* are those giving instruction to persons who have entered upon employment. Such

instruction is designed to fit these persons for useful employment in a trade or industrial pursuit other than the one in which they are employed.

3. *General continuation part-time schools or classes* are those giving instruction to persons who have entered upon employment. This instruction is given in subjects which will enlarge the civic or vocational intelligence of young workers.

HOME ECONOMICS PART-TIME CLASSES.

All part-time home economics instruction is home making extension. Any instruction in home making will be supplementary to at least a part of the daily employment of the average girl or woman, since it may be safely assumed that practically every girl or woman has household duties of some sort or another as a part of her daily employment. For these reasons, all part-time home economic classes will be of the type of trade extension classes, the trade in this case being home making. There are two more or less distinct groups of women to be reached through part-time home economics instruction.

(a) A group who have not had any extended experience as housekeepers but who have and are having certain household duties. This group is largely made up of young women who are employed in shops, factories, or stores, or who are occupied at home with the duties of the house daughter or the household assistant.

(b) An older group of women who have had years of experience in housekeeping and who are engaged for the most part in the business of housekeeping.

For many of the first group the instruction will be mostly preparatory work, as their experience in home making has been limited. However, it will be extremely difficult to decide how much experience in the home qualifies one for home making preparatory classes and what experience makes a student eligible for home making extension classes. Since both groups have had home making experience all instruction designed to better prepare for the occupation of home making may be classed as home making extension schools or classes, modifications being made in method of presentation and in subject matter depends upon the needs and experience of the groups to be reached.

HOME ECONOMICS IN GENERAL CONTINUATION SCHOOLS OR CLASSES.

Provision for continuation classes such as are described in Bulletin No. 17, Trade and Industrial Education Series No. 1, issued by the Federal Board for Vocational Education relating to trade and industrial education, will be considered as trade and industrial classes and not as home economics classes in so far as their ad-

ministration is concerned, and should be included in the trade and industrial section of the plan rather than in the home economics section. This is true even though home economics is to form a part of the instruction in such general continuation schools or classes, unless 50 per cent or more of the time of the class is given over to instruction in home economics subjects, in which case it shall be considered as a home economics class rather than a general continuation class, and is administered under the home economics parts of the fund and should be set up in the plan under home economics part-time schools or classes.

TWO GROUPS OF TEACHERS RECOGNIZED IN PART-TIME SCHOOLS OR CLASSES.

A recent ruling of the Federal Board relating to general continuation part-time schools or classes provides that two groups of teachers are recognized in such schools or classes:

- (a) Teachers of subjects designed to enlarge the civic intelligence.
- (b) Teachers of subjects designed to enlarge the vocational intelligence.

In the case of this latter group, qualifications are to be specified for teachers in each vocation in which instruction is to be given. In case home economics is included, this would mean that qualifications should be specified for teachers of home economics subjects.

The provision that if less than half the time in a part-time school or class is devoted to home economics, such school or class is to be considered as a general continuation school or class rather than a home economics extension class and is chargeable against general continuation school work, does not in any sense mean that in those States in which there is a supervisor of trade and industrial education and also a supervisor of home economics education, the supervisor of trade and industrial education and not the supervisor of home economics education shall plan for and promote the work in home economics education in general continuation schools and classes. The best arrangement for these classes will call for cooperation between the State supervisors of trade and industrial education and those of home economics education.

DISTINCTION BETWEEN PART-TIME HOME ECONOMICS EXTENSION CLASSES AND PART-TIME TRADE EXTENSION CLASSES.

Part-time home economics extension schools or classes offer instruction in home making, planned to meet the needs of women over 14 years of age who have entered upon employment either as wage earners or who are employed with home duties as house daughters or home makers. The education of many of these women has been deficient in some phase of home making, and they are interested in

extending their knowledge of child care, home nursing, food preparation, home management, sewing, etc.

Work of this character is considered part-time home-economics extension work, because it is planned to further fit the persons taking it for useful employment in the home-making pursuit, a pursuit in which they are already employed. This is quite different from trade extension work, which is given for those engaged in some other occupation than home making. Such a class would be a group of sewing women from a shop who are taught costume design as a supplement to their employment as dressmakers. Wherever instruction has for its end the further preparation of a woman for her duties as a home maker or as a household assistant this instruction belongs in the field of home economics and is subsidized from this portion of the fund. When, however, the instruction prepares or further fits a person to earn a livelihood in some special occupation, such as nursing, cooking, dressmaking, etc., it is clearly trade or industrial instruction and would be subsidized from the trade and industry portion of the fund.

AGE OF ADMISSION.

Part-time classes are open to women over 14 years of age, without upper age limit, provided that the instruction given is designed for and suitable to enlarge the civic or vocational intelligence of workers over 14 and less than 18 years of age.

PLANT AND EQUIPMENT.

The same type of laboratory and equipment outlined under all-day schools should be required. In most cases the same laboratory and equipment used for home economics classes in all-day schools will also be used for the part-time classes. This arrangement will prove satisfactory if individual equipment is provided and if the classroom work is supplemented by the work of students in their own homes. Where the group is small a practice house or apartment would provide the best arrangement. Here the work could be conducted as nearly under home conditions as is possible. Excellent work may be done by an itinerant teacher who meets small groups of women in certain homes as housekeeping centers and gives them part-time instruction under home conditions.

In some cases it will be found advantageous to carry the instruction to the student. Through cooperation with employers it is frequently possible to secure at little expense to the community adequate plant and equipment for part-time home economics extension schools or classes near industrial plants where large groups of girls and women are at work.

COURSES OF STUDY.

The instruction offered in part-time schools or classes must be supplemental to the daily employment and will vary with the group to be reached. For the younger group of women who are either at work as wage earners or employed in the home as house daughters the instruction given will be very like that offered in home-making classes in all-day schools. Since, however, the time devoted to instruction is more limited, it will be necessary to choose from the courses as presented in all-day schools those topics in which the most essential problems of home making are taught. As attendance on part-time classes is required by State law in only a few cases, the students taking such instruction are ambitious young women who are eager for further education and who attend the course with regularity if the material is chosen to fit their needs.

For the older group of women who have had the experience both of the house daughter and the manager of the home, the instruction will be more like that offered in evening schools or classes and should include only those subjects which are of greatest interest and value to the learner. The interest of this group is directed toward the solving of specific problems as they arise in the management of the home. These women are not so much interested in the "manipulative processes" except in cases where they are seeking to learn new methods or to extend their knowledge along a particular line.

In outlining a course of study for homemakers which is to lead to increased knowledge or skill in the occupation in which they are employed, it is essential that the content of the course be based upon an analysis of the occupation of home making. Such an analysis shows clearly that as a home maker the woman is largely responsible for the—

- (1) Feeding of the family.
- (2) Clothing of the family.
- (3) Care and welfare of children.
- (4) Care of the health of the family.
- (5) Management of the home.

Instruction in home economics extension classes should therefore cover these various phases of the home-making occupation.

LENGTH OF COURSE.

Part-time schools or classes must be organized for a minimum of 144 hours of instruction during the year, and the classes must be held during the regular hours of employment. The work is or-

ganized as outlined for part-time trade or industrial schools. This is usually on the basis of four hours of instruction a week for 36 weeks, or if preferred this may be increased to eight hours a week for 18 weeks. Any other variation is permissible, provided the class instruction is offered for a minimum of 144 hours. In some cases it might be more convenient for half the day to be spent in school and the other half day in industry, or alternate days or weeks might be spent in school and in industry. The entire course might be so planned as to coincide with a dull or off-season in some such industry as millinery, toy making, etc.

OUTLINE OF SUGGESTED COURSE IN THE USE AND PREPARATION OF FOOD FOR PART-TIME CLASSES.

UNIT I.—CEREALS AND STARCHES.

Lesson 1.—Starch puddings, cream soups, and cream toast.

Lesson 2.—Breakfast cereals.

Lesson 3.—Rice, hominy, and barley.

Lesson 4.—Starch products, macaroni, and tapioca.

Lesson 5.—Beverages.

Lesson 6.—The breakfast menu.

UNIT II.—FRUITS AND VEGETABLES.

Lesson 1.—Value of fruits and vegetables in the diet. Ways of using fresh fruit.

Lesson 2.—Preparation of dried fruits and use in diet.

Lesson 3.—Ways of cooking potatoes.

Lesson 4.—Cooking green vegetables.

Lesson 5.—Vegetables as conservers of other foods.

Lesson 6.—The vegetable dinner.

UNIT III.—MILK, EGGS, AND CHEESE.

Lesson 1.—Milk and its value in the diet.

Lesson 2.—Cooking of eggs.

Lesson 3.—Custards and custard puddings.

Lesson 4.—Frozen dishes from milk and cream.

Lesson 5.—Cheese and its uses in the diet.

Lesson 6.—Making and use of cottage cheese.

Lesson 7.—Luncheon menu.

UNIT IV.—PEAS, BEANS, AND NUTS.

Lesson 1.—Peas and beans.

Lesson 2.—Pea and bean soups.

Lesson 3.—Nuts and their use.

Lesson 4.—The meatless meal.

UNIT V.—MEAT, FISH, POULTRY, AND GAME.

- Lesson 1.*—Selection of meat.
- Lesson 2.*—Method of cooking tender cuts.
- Lesson 3.*—Cooking tough cuts; use of offal portions.
- Lesson 4.*—Method of extending meat flavors.
- Lesson 5.*—Soups and broths.
- Lesson 6.*—Fish and other sea foods.
- Lesson 7.*—Poultry and game.

UNIT VI.—FATS.

- Lesson 1.*—Selection of fats; methods of handling waste fat in the home.
- Lesson 2.*—Use of home-rendered fats in cooking.
- Lesson 3.*—Pastry.
- Lesson 4.*—Deep fat frying.
- Lesson 5.*—Salads and salad dressings.

UNIT VII.—BATTERS AND DOUGHS.

- Lesson 1.*—Quick breads.
- Lesson 2.*—Use of whole wheat and graham flours.
- Lesson 3.*—Use of flours from other cereals.
- Lesson 4.*—Sour milk and molasses mixtures.
- Lesson 5.*—Yeast breads.
- Lesson 6.*—Cakes and cookies.

UNIT VIII.—SUGAR AND SWEETS.

- Lesson 1.*—The use of sugar in the diet.
- Lesson 2.*—Candies from cane sugar.
- Lesson 3.*—Candies from sirups.
- Lesson 4.*—Ices.
- Lesson 5.*—Gelatine desserts.

UNIT IX.—HOME PRESERVATION OF FOOD.

- Lesson 1.*—Canning of fruit.
- Lesson 2.*—Canning of vegetables.
- Lesson 3.*—Fruit juices.
- Lesson 4.*—Jelly making.
- Lesson 5.*—Preserves, jams, butters, and marmalades.
- Lesson 6.*—Pickles.
- Lesson 7.*—Salting and fermentation.

UNIT X.—FEEDING THE FAMILY.

- Lesson 1.*—How to estimate the food needs of the body.
- Lesson 2.*—Supplying the body with fuel.
- Lesson 3.*—The protein requirement.
- Lesson 4.*—Mineral matter necessary for growth.
- Lesson 5.*—Providing body-regulating substances.
- Lesson 6.*—Proper division of the food requirement into meals.
- Lesson 7.*—The cost of food for a day.
- Lesson 8.*—Planning the menu for a day.

UNIT XI.—SPECIAL ADAPTATIONS OF THE DIET.

Lesson 1.—Infant feeding.

Lesson 2.—Feeding children under school age.

Lesson 3.—Feeding the school child.

Lesson 4.—Feeding the aged.

Lesson 5.—Feeding in constipation.

Lesson 6.—Feeding in overweight for weight reduction.

Lesson 7.—Feeding in underweight for weight increase.

Lesson 8.—Adapting the menu to the needs of the family group.

UNIT XII.—THE HOUSEKEEPER AND THE FOOD PROBLEM.

Lesson 1.—Discussion of the food problems of the housewife.

Lesson 2.—Home production of food.

Lesson 3.—Fuel and time saving in food preparation.

Lesson 4.—Simplifying standards of living.

Lesson 5.—Economy in buying of foodstuffs.

Lesson 6.—Community kitchens.

This course is outlined in 12 units covering about 75 lessons. Each lesson is outlined to cover a period of two hours, and is so planned that the student is given the opportunity to carry on the manipulative work in the laboratory. Such a course may be offered for groups who are particularly interested in food problems and in learning to prepare food for the family.

The order of the lessons may follow that suggested, or any sequence of units or lessons, which best fits the needs of the class, may be offered. For those interested in the more general phases of homemaking a course might be offered which is made up of a combination of units which cover some of the essential points in the use and preparation of food, clothing the family, the care of the health of the family, care of children, and home management.

Instruction in related subjects may be offered as a part of a program for part-time schools and classes. This work would be art and science as related to problems of the household, and should include such subjects as applied art and design, costume design, general science, elementary household, chemistry, physics, etc., taught in direct relation to the home and the home-making activities. Such courses should supplement and broaden the instruction in home making.

METHODS OF INSTRUCTION.

Methods of instruction will vary somewhat with the two groups to be reached. With the younger group, where the course differs but little from the course in the all-day school, the method of instruction will be much the same as that followed in the all-day school. It should be kept in mind, however, that since only a short time is spent in class-room work and the greater part of time is spent at

work in the home or in some other occupation, the instruction must be planned so as to relate the classroom problems very closely to the problems of the home, and only the most important topics in a subject should be covered. As a group the students are keenly interested and have initiative. Except in a few cases, the students have come voluntarily to the class because they felt a lack in their education and desired help. Instruction must furnish quicker, better methods of solving their problems and further develop initiative and independence in their work.

In the case of young students it is highly desirable for the accomplishment of the best results that the students be grouped for instruction in home economics on the basis of their previous school work. Experience shows that where a class is made up of groups of students from different grades the class is not able to accomplish as good work in home economics as where the students from the same grade of school work are grouped together. When the students reached are more mature or of foreign birth they must be grouped on the basis of the amount and character of their practical experience, nationality, needs, etc.

Where a class is made up of older women who have had more experience and who are spending a greater part of the day in the occupation of homemaking more emphasis should be placed upon the various phases of homemaking which embrace the choice and use of foods in the diet, how and what to select in clothing materials, how to spend the family income so as to get the largest returns, etc. These subjects are of fundamental importance in a course in homemaking and should receive large consideration. Interest in these subjects is however not so easily aroused. The type of women will determine how much stress must be placed on the technical work.

QUALIFICATIONS OF TEACHERS.

Both teachers of home economics subjects and teachers of related subjects are necessary in the successful carrying out of the scheme of part-time education. These teachers, above all things, need an extended experience in the vocations they are teaching. The students in the part-time school are there for very definite help and will respect only the teacher who has had not only definite training in home economics subjects, but also first-hand knowledge of the conditions to be met in solving the home makers' problems.

In addition to practical experience and adequate technical training, this teacher must know how to present the important points quickly and in the most telling fashion. She must have ability to analyze and organize material as well as a knowledge of the best methods for the presentation of the subject.

The States are setting up their qualifications for part-time teachers in the same terms as for the teacher in the all-day school—practical experience, training in home economics, and professional training. The same amount of training, however, is not demanded. Frequently two years of training is required in place of the four years required for the teacher in the day school.

The woman with successful trade experience is to be encouraged as a teacher of vocational classes; particularly is this true for millinery and dressmaking when the trade standard is the desirable one. An effort should be made on the part of teacher-training institutions to provide special short courses for the training of such women for part-time and evening work.

The personality of the teacher is a very large factor in her success in part-time or evening classes and she should be selected on the basis of her special interest and ability in dealing with the problems of part-time education. The teacher should not only know the vocation of home making which is to be taught, but must be interested in the general problems of trade and industrial education so that she may know the working experiences of the large group of students who come to home economics part-time classes from the various trades. This will mean studying the conditions under which her pupils work and live so that she may closely relate the classroom instructions to the previous experience of the students.

III. EVENING SCHOOLS OR CLASSES.

CONDITIONS AND STANDARDS SET UP BY THE VOCATIONAL EDUCATION ACT WHICH APPLY TO EVENING SCHOOLS OR CLASSES.

Home economics evening schools or classes provide instruction for groups of workers over 16 years of age. The members of this group know rather definitely their own needs and are attracted to the evening classes because they come at an hour that does not interfere with regular employment, and usually promise to give large returns for the amount of time demanded in instruction.

The groups of women who should be reached by evening school instruction are:

1. Those who either expect soon to have charge of their own homes or who are interested in preparing themselves for home-making responsibilities

2. Those with interests similar to the interests of the group described under part-time education, i e., women who are already home-makers or household assistants and who desire to extend their knowledge of home making that they may be more efficient in some particular phase of their vocation.

3. Those who see the personal advantage of knowing how to do their own sewing or to make their hats, cook their meals, budget their incomes, etc.

The distinction between part-time and evening schools and classes needs to be clearly stated so that both types of classes may be encouraged and so that there may be no confusion in establishing the work nor in reimbursement for such schools or classes. Part-time classes are organized to give instruction during the hours of usual employment either as housekeepers, house daughters, or in some wage-earner's occupation.

Evening schools are organized to give instruction to women who are employed as above, but to give this instruction outside of the regular hours of employment. In the case of housekeepers, where the hours of employment are indeterminate, evening classes may be organized in the afternoon when their household duties require their attention during the evening. Part-time schools are open to persons over 14 years of age, while evening schools are open to persons over 16 years of age. The course of instruction in part-time schools must extend over a minimum of 144 hours, while for evening schools there is no minimum number of hours of instruction required.

Reimbursement for part-time schools or classes is paid out of the one-third of the fund for trades, industries, and home economics, reserved to be spent, if spent at all, for part-time education. Reimbursement for evening schools or classes is paid out of the same portion of the fund for trades and industries and home economics as are the day schools or classes in home economics.

Distinction between home economics evening school instruction and trade and industrial evening school instruction for those women's trades that have grown out of the activities of the home.—The distinction is based upon the difference in the aim of the two courses, the content of the lessons, and the method of instruction employed. Evening schools or classes in home economics are designed to teach the various phases of home making to women who are desirous of using this information in their own homes or for wage-earning employment as household assistants. As was stated earlier, home making is a composite occupation and the home maker needs instruction in a number of semiskilled trades. Where a group of women are at wage-earning employment in one specialized trade, as for example, cooks, dressmakers, and milliners, who desire instruction along some definite line which will supplement their daily employment and will fit them for advancement in their trades, such instruction is classed as trade extension. These classes should be outlined in the State plans under trade and industries and should be subsidized from the trade and industry portion of the fund.

AGE OF ADMISSION.

Evening schools or classes in home economics offer instruction to women over 16 years of age. Such instruction must be supplemental to their daily employment, and must be given to those whose work is such that the skill or knowledge taught helps the worker to greater efficiency in her present-day employment.

As in the case of part-time schools and classes it is conceded that all women have, to a greater or less degree, household duties regardless of whether or not they are actually engaged in keeping house. With such an understanding home economics classes in evening school are open to any woman who is engaged to any extent, or in any way, in the performance of household duties, and are not limited to women who give their entire time to employment within the home.

PLANT AND EQUIPMENT.

It is not necessary that evening work be given in a public-school building, although if the class is large a well equipped home-economics laboratory is the most satisfactory equipment which can be provided. When the size of the class permits instruction in the housekeeping center, which is a home or an apartment loaned or fitted up especially for home economics instruction, it is much to be preferred. It is important that equipment be provided wherever it is possible, to give to each student the opportunity to carry out the manipulative processes. Where adequate equipment can not be secured the work can be carried on by means of demonstrations and classroom instruction. The rooms should be well lighted and well heated in winter, since women who have worked hard all day can not work to advantage in the evening under circumstances that do not favor good instruction.

MAINTENANCE.

The success of evening school work depends to a very large extent upon the choice of the teacher. It is important that such maintenance be provided as will insure the services of a well-trained teacher, who is in full sympathy with the ideals and methods of evening school instruction.

The cost of supplies for evening school work will vary with the instruction. The classes in sewing and millinery require very few supplies, as the materials are all furnished by the members of the class. The maintenance of the food classes will vary with the size of the class and type of work taught. In some classes the materials

are furnished, while in others the students pay for their own supplies and are entitled to the product. Such a scheme may be carried out successfully as a supper class, where the women come directly from work and prepare their evening meal.

COURSE OF STUDY.

Experience with evening schools and classes indicates conclusively that the short-unit course is the desirable basis of organization for such classes. The short-unit course has a definite aim, is complete in itself, and is open to persons unable to attend classes for long periods of time.

Grouping the work into units offers a variety of choice, and thus gives an opportunity to the woman to choose only such work as fits her particular need. Further, courses may be planned by grouping the units in any sequence and into any length course, depending entirely upon the demands, the previous experience, and the time at the disposal of the group.

OUTLINE OF SUGGESTED TYPE OF COURSE FOR EVENING CLASSES.

The following is a suggestion for a group of units to be offered for instruction in clothing in evening class:

Before offering a unit the needs and choice of the groups to be reached by such instruction should be studied. Women will not come for evening work unless the course offers what they really want.

CLOTHING FOR THE FAMILY.

Unit I.—Beginners' Unit.

The aim of this unit is to teach the fundamental processes of sewing. This is accomplished through the making of three garments, each one of which offers problems not met with in the other.

Problem I: Chemise.

Lesson 1.—Selection of pattern, cutting, and fitting.

Lesson 2.—Hems, buttons, and buttonholes.

Lesson 3.—Neck and armhole finishes.

Lesson 4.—Neck and armhole finishes.

Problem II: Underskirt.

Lesson 5.—Use of sewing machine, cutting, and basting.

Lesson 6.—Seam finishes.

Lesson 7.—Plackets.

Lesson 8.—Hems and flounces.

Problem III: Bungalow apron.

Lesson 9.—Cutting and fitting (speed work).

Lesson 10.—Seams, neck, and sleeve finishes.

Lesson 11.—Hem, placket, and belt.

Lesson 12.—Laundering, removal of stains.

Unit II.

Washable dress:

- Lesson 1.*—Selection of pattern, cutting and basting dress.
- Lesson 2.*—Fitting and alterations.
- Lesson 3.*—Seams.
- Lesson 4.*—Plackets.
- Lesson 5.*—Methods of finishing skirt at waist line.
- Lesson 6.*—Hems.
- Lesson 7.*—Belts and girdles.
- Lesson 8.*—Cuffs, sleeve finishes, fastenings.

Unit III.

Wool dress:

- Lesson 1.*—Testing pattern, cutting, and basting dress.
- Lesson 2.*—Fitting and alteration.
- Lesson 3.*—Seam finishes, tucks, and placket.
- Lesson 4.*—Methods of finishing waist.
- Lesson 5.*—Sleeves.
- Lesson 6.*—Hems and facings.
- Lesson 7.*—Hanging skirt.
- Lesson 8.*—Collar, cuffs, and girdle.
- Lesson 9.*—Finishes and fastenings.
- Lesson 10.*—Class criticism of finished dress.

Unit IV.

Dress form:

- Lesson 1.*—Fitted lining for dress form.
- Lesson 2.*—Padding of dress form.
- Lesson 3.*—Methods of draping waists.
- Lesson 4.*—Methods of draping sleeves.
- Lesson 5.*—Method of draping skirts.
- Lesson 6.*—Methods of draping dresses.
- Lesson 7.*—Class criticism of designs.

Unit V.

Conservation of clothing:

- Lesson 1.*—Care and renovation of silks and wool.
- Lessons 2-5.*—Remodeling garments.
- Lesson 6.*—Repair of underclothing.
- Lesson 7.*—Repair of outer clothing and household linen.

Unit VI.

Party dress:

- Lesson 1.*—Foundation lining.
- Lesson 2.*—Pattern draping for skirt.
- Lesson 3.*—Pattern draping for waist and overdraping.
- Lesson 4.*—Pattern draping for sleeves.
- Lesson 5.*—Making pattern and cutting dress.
- Lesson 6.*—Fitting, seams, and placket.
- Lesson 7.*—Edge finishes.
- Lesson 8.*—Adjusting overdraping, girdle, and fastenings.

Unit VII.

Infants' and children's clothing:

Lesson 1.—Choice of garments for layette.

Lesson 2.—Flannel undergarments.

Lesson 3.—Slip and night dress.

Lesson 4.—Kimona wrapper and sack, sleeping bag.

Lesson 5.—General discussion of children's clothing.

Lesson 6.—Cutting and fitting bloomers and dress.

Lesson 7.—Making bloomers and dress.

Lesson 8.—Finishing bloomers and dress.

Unit VIII.

Boy's suit:

Lesson 1.—preparation of material, cutting, and basting.

Lesson 2.—Fitting and padding jacket.

Lesson 3.—Making jacket.

Lesson 4.—Sleeves and lining.

Lesson 5.—Buttons and buttonholes.

Lesson 6.—Cutting trousers.

Lesson 7.—Making trousers.

Lesson 8.—Finishing trousers.

LENGTH OF COURSE.

Instruction in evening schools or classes does not have to be offered for a definite period. The organization of the work into short units enables the students to enter the course at the beginning of the unit which seems to fit their particular need and to withdraw, if they so desire, when the unit is completed. Registration for evening classes may be twice, three, four, or six times a year, depending upon the number of units of work offered.

METHODS OF INSTRUCTION.

The methods of instruction in evening schools are much the same as those which are employed in the instruction which is given to the older group in part-time classes. The aim of the groups reached is similar, but their experience varies from the stenographer who has not lived at home for years, yet who expects soon to be married, to the married woman who has several children and who has had years of experience in the management of a home. Frequently a class will be made up of representatives of each group, but whenever the class is large enough to admit of sections, these groups should be separated for instruction so that the individual needs may be more easily met.

Every student should work on a problem involving common fundamental principles so that class instruction may be possible. This results in better work and enables the teacher to reach more succe-

fully a larger group. However, this does not mean that the garments under construction must be identical. Variety may be secured in material and choice of pattern to be used.

ORGANIZATION OF EVENING SCHOOLS.

So important is this type of school in the development of vocational home economics that a word treating upon the organization and conduct of such schools may be in place here. The evening school is by no means a new type of school in this country, and wherever it has failed to function effectively as an agent in vocational education it has been largely due to the fact that the same principles and methods have been applied here as in other types of schools, whereas the purpose and aim of the work, as well as the class of students, have been very different.

The efficiency test of an evening school must be stated, not in terms of the large number of students induced to enroll but the stability of the classes, the permanency of class membership, and the number and kind of new recruits.

People who enter evening schools usually want definite aid, and when they discover that this is not forthcoming there is no longer a tie to hold them in school.

It is therefore important that much preliminary work be undertaken in the organization of evening schools.

The types of homes in the community, the household practices, and the employment of household help will dictate in large measure the kinds of classes to be organized and work to be undertaken. The industrial and commercial life of the community has its effect on household habits and on the character of foods, clothing, and home activities. Since evening-school classes for home economics will be composed largely of the housewives of the community, studies of the conditions and needs should be carefully made before classes or schools are organized. Local organizations of women may be used in making these investigations, in establishing the schools, and aiding their progress. Conferences with groups of housewives on the general plan and purpose of evening-school work will be helpful. Women may often best be reached by house-to-house canvass, by enlisting the aid of the leaders in the community, men and women, or through the children in the schools. A vigorous campaign for membership must be conducted.

Time should be given for a personal interview with each woman who desires to enroll, that she may be assigned to the group and the short unit course most nearly allied to her needs. While much latitude will be allowed for infringement of regulations that are of paramount importance in day schools, such as punctuality, regularity of attend-

ance, work on outside projects, etc., every effort should be used to obtain the maximum observance of these, consistent with efficient work.

Records should be kept and legitimate devices used to promote punctuality and decrease absence. The short unit course itself is a great factor in securing these by the rapid intensive work that always creates interest.

A plan of granting credit which recognizes the accomplishment of a piece of work even if it is only a single short unit course is an excellent device to stimulate interest and hold the students until the end of the course and when these courses are arranged in a proper sequence, the completion of one course and receiving of a certificate will influence the student to take the next course.

QUALIFICATIONS OF TEACHERS.

It is important that teachers of evening schools and classes have practical experience, technical training in home economics and professional training, although the term of such training may be reduced below that of the part time or all-day teacher. The evening school-teacher must have had adequate practical experience which takes the place of a large part of the technical training, for above all else, she must know the phase of homemaking she is to teach. This experience must be supplemented by methods in teaching which will enable her to present her material to a class. A woman with good trade experience can often be secured, who might be given the adequate professional training by the supervisor as a part of her itinerant teaching. Besides the above qualifications it must be remembered that personality is a large factor in choosing a teacher of evening school. She must be possessed of abundant physical vigor, must like people, and must be interested in evening school work.

SUPERVISORS.

Before the qualification of a supervisor of vocational home economics can be determined it is necessary to understand clearly the duties of a supervisor. These duties are in the main two:

1. To assist teachers who are already in service, and to assist communities which have already started something in the way of instruction along vocational lines or which have signified a desire to initiate a program of vocational instruction. In the discharge of this duty a State supervisor is in a way a missionary in the State, an itinerant teacher of teachers, a stimulator of vocational teachers. The supervisor should also be a stimulator of communities, putting before the people the possibilities of vocational instruction and

assisting these communities to establish satisfactory vocational schools or courses.

2. Along with this stimulating duty a State supervisor has the onerous duty of checking up the work of teachers or schools. Acting in this capacity, administering a system of vocational education in which the State has a responsibility for the success or conduct of a school, the supervisor is a policing officer charged with the duty of determining whether or not the school meets the standards set up for the State.

From this analysis of the duties of a supervisor it is clear that standards of qualification for a supervisor should at least be those set up for the teacher of home economics, and she should have in addition not less than two years of successful experience in teaching home economics. It is desirable that a supervisor have had administrative experience and have made a special study of home problems and of school organization.

CERTIFICATION.

CERTIFICATION FOR TEACHERS OF HOME ECONOMICS SUBJECTS AND OF RELATED SUBJECTS.

Each State has set up a standard for certification of its teachers of home economics. It is highly desirable that the system of certification for teachers of these subjects be based upon vocational experience, technical preparation, and professional training appropriate to these subjects. A system for the certification of teachers of home economics subjects should provide separate certification for teachers of all-day school, part-time, and evening school work according to the extent of preparation demanded and the nature and degree of specialization characterizing the preparatory training. Certification for teachers of related subjects should provide separate certification for teachers of related science and of related art subjects.

PART III.

THE TRAINING OF TEACHERS UNDER THE VOCATIONAL EDUCATION ACT.

Under supervision of State board.—The training of teachers must, according to the provisions of the act, be under the supervision of the State board. This board designates the institution or institutions in the States that are best prepared to give this training and through its representatives inspects the institution from time to time in order to see whether the work is being conducted in accordance with the agreement that has been set up between the State board and the Federal Board.

Selection of institutions for teacher training.—The policy of the State should be to designate the institution which is best qualified to offer an adequate course for the training of teachers of home economics. If within a State there are more than one equally good institutions the State board should select one to carry on the teacher-training work, unless it is shown that one institution can not prepare the probable number of home economics teachers needed in the State; in that case additional institutions may be designated to carry on this work.

The following points should be considered in choosing a teacher-training institution:

(1) The institution should be prepared to give good technical home economics instruction. This means that the institution should have the facilities for and be engaged in teaching home economics as a preparation for home making. Adequate instruction along this line presupposes a well-trained faculty with practical as well as college training. It is desirable that most of the faculty have had some graduate work in home economics, as the research point of view is of value if the teacher is to keep abreast of the rapid development of the subject of home economics.

(2) The institution should be one that is in close touch with the schools and the homes of the State, so that it may train teachers for the schools who are well fitted to meet the needs of home making in the various sections of the State.

(3) There should be adequate laboratory facilities for home economics work. Laboratories for food preparation, the serving of meals, clothing construction, textile study, and home management are essential. These laboratories must provide facilities for individual laboratory work. Laboratories for home nursing and child study are desirable.

(4) There should be adequate facilities for teaching the related arts and sciences, with the requisite laboratories.

(5) There should be good general instruction in English, civics, history, sociology, and economics.

(6) Professional courses in education, including practice teaching, should be provided. The student teaching should be equivalent to a three-semester hour course, each student being given the opportunity to teach a minimum of 36 lessons in home-making subjects.

(7) The type of instruction followed in the more elementary home economics subjects should be as nearly as possible that appropriate for the high-schools. "Example is stronger than precept." Well-taught, practical college courses are the best supplement to professional training.

Kinds of teachers to be trained.—In discussing the training of teachers, the different kinds of teachers needed should be noted. There are three types of schools, the all-day school, the part-time school, and the evening school. For these three types of schools teachers of slightly different preparation are required.

Length of course.—Four years' training is the standard which should be demanded for the training of teachers of all-day schools. In those States in which courses of two or three years are now accepted it should be understood that this is only a temporary expedient. Less college training may be demanded for the preparation of instructors in part-time and evening classes, as certain types of practical experience, so desirable in these teachers, can be substituted for part of the technical college work.

CURRICULA FOR TRAINING TEACHERS OF HOME ECONOMICS.

Entrance requirements.—The entrance requirements are those of the institution selected to do the training. In most States this is four years of high-school training or its equivalent. For the vocational home economics teacher, experience in home making is required. The students should either present for entrance satisfactory evidence of such experience or make arrangements to get it during the summer vacations. Most of the States have set up this requirement: Two years of experience in the home as a house daughter, during a part of which time a large share of the responsibility in the management of the home is assumed.

Course of study.—The subjects required to develop efficient teachers of home economics fall into four groups:

1. *Home economics.*—These are technical in nature and should provide vocational experience in the form of laboratory work to supplement the previous vocational experience of the girl and to give essential instruction in the occupation of the home maker.

2. *Related subjects.*—There are certain art and science courses which are necessary for the proper development and understanding of the courses in home economics. These should be required as prerequisite or parallel subjects in a teacher-training course.

3. *Education or professional subjects* include those which have as their aim teaching students how to teach, and include those usually required as a basis of certification for teaching in secondary schools.

4. *General.*—Certain nonvocational subjects chosen for their significance and value in the development of the students and in relation to their vocational needs.

DISTRIBUTION OF TIME—FOUR-YEAR COLLEGE COURSE.

A suggestion for the proportion of time to be spent on each of these groups and the subjects to be covered are indicated for a four-year college course in the following table. The percentage distribution of time to home economics and related subjects will depend upon whether or not any of the related subjects are taught in the home-economics departments. This is frequently true of the work in art, and often courses in chemistry are given as a part of the home economics curriculum.

An approximation of time and distribution of subjects in a four-year course of 120 semester hours.

Home economics, 25-35 per cent.	Related, 20-25 per cent.	Professional, 10-12 per cent.	General, 25-45 per cent.
Selection and construction of clothing. Textiles. Selection and preparation of food. House planning and furnishing. Home nursing. Nutrition and dietetics. Advanced clothing. Child care. Household management, including supervised practice work in a home.	Science: Biology. Physiology. Chemistry (Inorganic, qualitative, quantitative, organic, including food analysis, textile, physiological.) Physics. Bacteriology. Art: Elementary design. Advanced design, as applied to the household.	Educational psychology. General methods. Special methods. Principles of vocational education. Practice teaching in home economics.	English. Civics. Sociology. Economics. History.

Sequence of courses.—The following general suggestions should be considered in working out the sequence of the courses.

1. The sequence of the courses in home economics should be determined by the subject matter itself, the necessary prerequisite art and science courses and the specific needs of students.

2. The appropriate related subjects should be given as prerequisite or parallel with the home economics courses.

3. The professional subjects should be deferred to the latter part of the curriculum. The order noted in the table is desirable. In order to follow this sequence educational psychology should be given during the last half of the sophomore year (frequently this has a prerequisite of general psychology). The other professional courses are usually given in the junior and senior years.

Statement of essential relations indicating the home economic courses and the basic art and science courses which should be given as parallel or prerequisite courses.

TEXTILES AND CLOTHING.

<i>Prerequisites.</i>	<i>Home economics subjects.</i>
Drawing, decorating, and design.	Textiles and elementary study of clothing.
Advanced design, including dress design and furnishings.	Selection and construction of clothing.
	Advanced study of clothing.

FOODS AND HOME MANAGEMENT.

Chemistry.	Food study and cookery.
Biology.	Elementary dietetics.
Physiology.	Food and nutrition.
Bacteriology.	House planning and furnishing.
Organic chemistry.	Experimental cookery.
Physics.	Dietetics.
	Home management.

CURRICULA FOR TRAINING TEACHERS OF ART AND SCIENCE

The curricula for training teachers of art and science, as applied to home economics, should be a four-year college course and as far as is possible the curricula of the teacher training institution should offer the equivalent of the science and art required for the preparation of the teacher of science or art in that State. In addition the teacher should have enough work in home economics to clearly see the relations of home economics subjects to science and art. This does not preclude men from the teaching of related science or art; it does, however, emphasize the importance of an adequate contact with home making either through home experience or through home economics courses in school, so that the fundamental relationships are clearly understood and appreciated.

The professional courses will be much the same as those suggested for the training of home economics teachers. For teachers of related science one of the professional courses should include a study of the place of science in modern education and the organization and methods of teaching science. A similar course should be planned for the teachers of related art. Practice teaching in the respective

fields of related art and related science should be provided whenever this is possible. Until such instruction is better established most of the student teaching will have to be in science, art, or home-economics classes.

For the training of the teacher of applied art the following courses in art have been suggested:

	Hours
Introduction to art-----	3
Drawing and construction (including some work from life)-----	3
The principle of design in color applied in simple objects-----	6
House planning, furnishing, and decorating-----	3
Design applied in dress and furnishings-----	3
	<hr/> 18

In training the teacher of applied science it is manifestly impossible to meet the requirements set up for all the individual sciences.

The following courses have been suggested:

General biology and botany-----	6
Bacteriology-----	3
Zoology }-----	6
Physiology }	
Chemistry (inorganic)-----	6
Chemistry (qualitative and quantitative)-----	3
Chemistry (organic)-----	3
Chemistry of food and nutrition-----	3
Physics-----	6
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Graduation requirements.—Graduation requirements are set up by the institution giving the training, but must conform to the requirements for certification outlined by the State board. They usually include:

1. Adequate vocational experience.
2. Satisfactory completion of the approved course.

SHORTER CURRICULA.

Shorter curricula should, as stated above, be considered only a temporary expedient. Where necessary the same general rules indicated for the four-year course should be followed. The percentage division of hours devoted to the groups of subjects will not be the same. The amount of time devoted to home economics subjects will be proportionately larger as even a two-year training course must prepare the teacher as far as possible in the various phases of homemaking.

A two-year course should not be the first two years of a four-year course, but should be planned on the basis of including the essential subjects following wherever possible the general suggestions for the sequence of courses outlined under the four-year curriculum.

COURSE OF STUDY FOR THE TRAINING OF TEACHERS OF PART-TIME AND EVENING SCHOOLS OR CLASSES.

In the main the course of study for the training of teachers of home economics in part-time and evening classes is the same as is outlined for the training of teachers in the day school. Maturity of judgment and vocational experience are especially desirable here, so that every effort should be made to induce women with thorough vocational and professional training to supplement this with the needed technical training. They should be recruited so far as is possible from women with several years' actual homemaking experience, motherhood is a desirable but not a necessary prerequisite. A two-year course should be planned for their training, giving the technical information necessary to supplement the vocational experience and professional training where the woman has not already had this.

As is stated earlier, the supervisor, who acts in the capacity of an itinerant teacher, can do much in the recruiting and in the preparation of the teachers for part-time and evening classes. She has the opportunity to select either successful teachers in other lines of work who have had home experiences yet who need technical training; or to find women with adequate trade or technical experience who need methods in teaching so that they may satisfactorily present home economics subjects. Courses should be provided for the preparation of such teachers, and itinerant-teacher training should be recognized by the States as an important part of the teacher-training work.

PUBLICATIONS OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

Annual Report.

- * **The Vocational Summary**, published monthly by the Federal Board for Vocational Education (Vol. 1, No. 1, May, 1918).
- Bulletin No. 1. Statement of Policies.**
- * **Bulletin No. 2. For Use in Training Conscripted Men for Service as Radio and Buzzer Operators in the United States Army (International Code).**
- Bulletin No. 3. Emergency Training in Shipbuilding—Evening and Part-Time Classes for Shipyard Workers.**
- * **Bulletin No. 4. Mechanical and Technical Training for Conscripted Men (Air Division, U. S. Signal Corps).**
- Bulletin No. 5 (Reeducation Series No. 1). Vocational Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 166.)**
- Bulletin No. 6 (Reeducation Series No. 2). Training of Teachers for Occupational Therapy for the Rehabilitation of Disabled Soldiers and Sailors. (Also printed as S. Doc. 167.)**
- * **Bulletin No. 7. Emergency War Training for Motor-Truck Drivers and Chauffeurs.**
- * **Bulletin No. 8. Emergency War Training for Machine-Shop Occupations, Blacksmithing, Sheet-Metal Working, and Pipe Fitting.**
- * **Bulletin No. 9. Emergency War Training for Electricians, Telephone Repairmen, Linemen, and Cable Splicers.**
- * **Bulletin No. 10. Emergency War Training for Gas-Engine, Motor-Car, and Motorcycle Repairmen.**
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- * **Bulletin No. 12. Emergency War Training for Airplane Mechanics—Engine Repairmen, Woodworkers, Riggers, and Sheet-Metal Workers.**
- Bulletin No. 13 (Agricultural Series No. 1). Agricultural Education—Organization and Administration.**
- Bulletin No. 14 (Agricultural Series No. 2). Reference Material for Vocational Agricultural Instruction.**
- Bulletin No. 15 (Reeducation Series No. 3). The Evolution of National Systems of Vocational Reeducation for Disabled Soldiers and Sailors.**
- * **Bulletin No. 16. Emergency War Training for Radio Mechanics and Radio Operators.**
- Bulletin No. 17 (Trade and Industrial Series No. 1). Trade and Industrial Education—Organization and Administration.**
- Bulletin No. 18 (Trade and Industrial Series No. 2). Evening Industrial Schools.**
- Bulletin No. 19 (Trade and Industrial Series No. 3). Part-Time Trade and Industrial Education.**
- Bulletin No. 20 (Trade and Industrial Series No. 4). Buildings and Equipment for Schools and Classes in Trade and Industrial Subjects.**
- Bulletin No. 21 (Agricultural Series No. 3). The Home Project as a Phase of Vocational Agricultural Education.**
- Bulletin No. 22 (Commercial Education Series No. 1). Retail Selling.**
- Bulletin No. 23 (Home Economics Series No. 1). Clothing for the Family.**
- Bulletin No. 24 (Commercial Education Series No. 2). Vocational Education for Foreign Trade and Shipping.**
- Bulletin No. 25 (Reeducation Series No. 4). Ward Occupations.**
- Bulletin No. 26 (Agricultural Series No. 4). Agricultural Education—Some Problems in State Supervision.**
- Bulletin No. 27 (Agricultural Series No. 5). The Training of Teachers of Vocational Agriculture.**
- Bulletin No. 28 (Home Economics Series No. 2). Home Economic Education—Organization and Administration.**

All communications should be addressed to

The Federal Board for Vocational Education, Washington, D. C.

* Emergency war training for conscripted and enlisted men.



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BULLETIN No. 29

**REEDUCATION SERIES
No. 5**

Treatment and Training for the Tuberculous

**With Standards by Which to Determine
Proper Training and Occupations for the
Tuberculous Soldier, Sailor, or
Marine**

ISSUED BY THE

U.S. **FEDERAL BOARD FOR VOCATIONAL EDUCATION
WASHINGTON**

March, 1919

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FOREWORD.

At the very outset of its work with the discharged disabled soldiers afflicted with tuberculosis the Federal Board recognized that the problem of reeducation and placement in employment of these men is one that requires the best expert advice and assistance which the country affords. In order to provide this the National Tuberculosis Association was requested to detail to the office of the Federal Board its field secretary, Dr. H. A. Pattison, who has been giving his entire attention to this phase of the work of the Board under the vocational rehabilitation act.

To direct and assist him in the discharge of this responsibility an advisory committee of persons of long experience and national reputation in the field of tuberculosis was appointed, all of whose members have given of their services with enthusiasm. The members of this advisory committee appointed by the National Tuberculosis Association are: Fred M. Stein, chairman; W. H. Bladwin, Dr. H. M. Biggs, Dr. Vincent Y. Bowditch, Col. George E. Bushnell, Dr. Charles J. Hatfield, Dr. A. J. Lanza, Dr. David R. Lyman, Dr. James A. Miller, Mr. Douglas McMurtrie, and Dr. George M. Price.

When the committee began its labor it was realized that any intelligent and effective program for the vocational rehabilitation of the tuberculous man must be based upon sound principles which represented at least the consensus of opinion to which the experts had as a result of long experience arrived. It was felt, also, that the time had come for drawing up and issuing, in brief, simple, compact form, certain information with regard to the tuberculous man and his proper care and treatment which would be valuable to the man himself, his family, the public, and those engaged in or concerned in any way with the problem of his restoration to normal civilian life as a successful and independent wageworker.

With these ends in view the committee has formulated the statement of principles, policies, safeguards, and helpful information contained in this bulletin, which has been approved by the Federal Board and which is to be used as the basis of the work of the office of the Federal Board and its 14 district offices in dealing with every phase of the problem of the discharged tuberculous soldier, sailor, or marine. It is believed that it will be found to contain information of equal and lasting value to many others, to civilians as well as soldiers, to employers as well as to victims of the disease.

C. A. PROSSER,
Director.

TREATMENT AND TRAINING FOR THE TUBERCULOUS.

**Information Setting forth New Standards by Which to Determine Proper Training and Occupations
for the Tuberculous Soldier, Sailor, or Marine.**

[Prepared under direction of the advisory committee of the National Tuberculosis Association.]

By Dr. H. A. PATTISON, *Secretary*.

Tuberculosis is an infectious disease caused by a microorganism or minute germ called the tubercle bacillus. The germs are found most commonly in the sputum of those suffering with the disease. They may be found occasionally in purulent discharges from other organs or parts of the body affected by tuberculous disease, such, for example, as the knee joint. They are often found in the excreta, because of tuberculosis of the intestines, the kidneys, or bladder, etc. Almost every adult person has become infected. That does not mean that everyone has the disease—tuberculosis. It does mean that the germs have found entrance to the body and impressed themselves upon the organism in such a manner that their presence can be detected by certain well-recognized tests. The disease is never hereditary but is always acquired after birth. It is being more and more widely accepted that most infection occurs in childhood.

The prolonged intimate association of healthy persons with those having active tuberculosis leads to infection. It has been generally believed that infection is most commonly acquired by the inhalation of the dust of dried and ground-up sputum in the homes and on the streets. More recently, however, it is contended that infection is commoner by ingestion than by inhalation, germs being conveyed to the mouth upon the fingers of children who have been playing in contaminated places—the floors, sidewalks, gutters, etc., or with food handled by careless consumptives. Milk from tuberculous cows is also a common source of infection. It may occur by ingestion of droplets coughed or sneezed by careless consumptives in the home, crowded cars, shops, and places of assembly.

There may be no symptoms whatever in the beginning, and the bacilli may remain dormant until fortuitous circumstances break down the protective forces that have held them in abeyance, thus causing active disease processes with more or less pronounced symptoms. That is what happened in the Army. Thousands of men passed the draft boards and entered camps, never dreaming

they held within themselves possibilities for serious disease. The new life to which they were unaccustomed—long practice “hikes,” exposure, measles, influenza, pneumonia, etc.—broke down the defenses of many hundreds. On December 1, 1918, there were 4,855 soldiers in the Army tuberculosis sanatoria, 400 or 500 in base hospitals, and 500 or more overseas. These men did not contract the disease in the Army. It is probable that every one of them had harbored germs for years and broke down only because of unusual physical or emotional strain.

CLASSIFICATION.

After a time and under suitable treatment the “flare-up” subsides and the tuberculous man again becomes free of symptoms. It will be seen, therefore, that there are active and inactive or arrested cases. An individual may be a number of times alternately an active and an arrested case. Overstrain, fatigue, some excess, continued dissipation, or an attack of illness often reactivates the disease and renewed periods of treatment are required.

Pulmonary tuberculosis is also spoken of as “open” or “closed”; that is, there may be germs in the sputum or they may be entirely confined in the tissues so that none can be discharged by coughing or sneezing. Open cases are sometimes called “sputum-positive,” while closed cases are termed “sputum-negative.”

Usually open cases are active ones but some open cases are quiescent. They frequently exhibit very few, if any, symptoms and the disease appears to be stationary for many years. A number of such cases are able to work. This fact is important to bear in mind when discussing problems of placement. It is also important for medical officers to remember that there are many chronic quiescent cases with persistent râles who do not need sanatorium care and are able to work.

PHTHISIOPHOBIA OR FEAR OF TUBERCULOSIS.

The open cases, of course, are the ones who are a menace if their habits are untrained. The careful consumptive is not a menace. He who guards his cough and destroys his sputum is safe to work with and safe to live with. It is the careless consumptive and the one who does not know he has tuberculosis who is dangerous. And he is most dangerous to children. It is essential to realize that it is the children for whom we must fear and whom we must protect. Active cases of tuberculosis should avoid close contact with children. Sufficient safeguards are generally not thrown around children in whose families there is active tuberculous disease.

The fear of tuberculosis is not only exaggerated, but generally misdirected. The danger to fellow workmen in shops that are not overcrowded nor insanitary is not so great as is generally believed. If we could but make workers and employers understand that it is much better to have a known consumptive in the shop than an unknown one—that there is no valid reason for shunning a tuberculous person—we could much more easily control the disease.

PHYSICAL EXAMINATIONS.

If physical examinations of employees were made regularly and carefully the disease could be discovered in its early stages and its progress stayed. Unfortunately, of those who now come under treatment only a small percentage are very early cases; most of them are moderately or far advanced and the results are less satisfactory. A recent report of the Surgeon General of the Army states that "Tuberculosis constituted a cause of 4.1 per cent of all deaths from disease in the Army enlisted men in 1917. For the corresponding ages of life in the registration area of the United States tuberculosis constituted 34.7 per cent of all deaths. The contrast between 4.1 and 34.7 per cent indicates, in a rough way, the efficiency of the selective physical examination." Similar examinations of men in industry would permit intensive education and supervision which would greatly lower the morbidity and mortality rates.

TREATMENT OF TUBERCULOSIS.

The recognized treatment of the disease has become almost standard throughout the world. The purpose of treatment is the building up of the body, the healing of damaged tissues, and the walling in of the germs so that they may not be conveyed to other points, forming new foci of destructive activity. There are no medicines, tuberculins, serums, or vaccines that will cure tuberculosis. Nature heals and the patient helps by securing rest, fresh air, proper and sufficient food, and by maintaining a sanguine and tranquil state of mind. And it takes time—a long time—to heal tissues that have been invaded by so insidious a foe as the tubercle bacilli. Not months but years are usually required to bring about permanent arrest of the disease. The battle is a long and tedious one. It is a passive fight which is the hardest for previously active men to settle down to. New habits of life must be learned and a new self-control acquired. Hence the value of a period of treatment in a well-conducted sanatorium which is more a school of life than a hospital.

Rest is of prime importance. This sounds very simple, but it is less so than at first appears. It involves not only physical passivity but mental quietude. One can not rest who is all keyed up by ar

exciting book which has been read to him, nor can one rest if worried over family or financial troubles. In the very beginning of treatment it is generally necessary that the patient remain absolutely quiet in bed. It may be for a few days or it may be for a number of weeks. Too much emphasis, however, has been placed upon muscular rest without due consideration of mental rest. It is quite impossible for some temperaments to lie still and not become mentally restless. There is, therefore, an increasing drift toward diversional and occupational therapy, even while the patient is yet confined to his bed.

At the Army tuberculosis sanatorium in New Haven, Conn., occupational therapy was tried in the ward containing the sickest white patients in the institution. There was almost immediate improvement in the symptoms and there was marked improvement in the discipline and morale. It was found also that the work given them to do must be productive if the best results were to be obtained. Mere diversional therapy is not sufficient.

As soon as symptoms subside, carefully prescribed and supervised exercises begin. There is no difference of opinion among specialists concerning the value and necessity of rest in the treatment. As to how long complete rest shall continue there are differences. If the patient's exercise is carried out under careful medical supervision, it is quite possible to keep a strict check on the case and curtail the exercise privilege when it grows too great.

It is impossible for the average patient to keep these necessary checks upon himself, particularly if he has not had the training of sanatorium life. Hence the home treatment alone is dangerous. The untutored and unsupervised case may undo in an hour what has been gained in weeks. A certain young man with early tuberculosis insisted upon treating himself by going to live on a farm. He was walking along the railroad track one day when it began to rain, and a passing hand car picked him up. Not wanting to ride without doing his bit, he helped to "pump." This brought on a hemorrhage and reactivated his disease. Some unforeseen contingency, some thoughtless act, breaks the unsupervised consumptive.

Fresh air, and preferably outdoor air, both night and day, is next in importance in the treatment. Sleeping out of doors by those who work indoors is highly desirable, but if one is working out of doors all day sleeping indoors is not harmful, provided, of course, the room is well ventilated.

Climate is of less importance. Tuberculous people can and do get well in all sections of the country—in the mountains, at the seashore, on the prairies, North, South, East, and West. Without question there are some regions that are better than others for the tuberculous, but they are not always those regions that have the

reputation of being the best. Climate can not take the place of good medical and nursing care. If one has ample funds to seek a more favorable climate and get its benefits under medical supervision the change may be very desirable. If one must look for a job or is going to be depressed by the separation from family and friends, then one might better remain at home and secure treatment in a near-by sanatorium.

The United States Public Health Service bulletin on "Climate and Tuberculosis," by Dr. John W. Trask, is a concise and enlightening monograph that should be read carefully by every vocational adviser and tuberculous person.

Good food and plenty of food is necessary for the building up of the tissues. Merely putting on flabby fat is harmful. Forced feeding, which was practiced a few years ago, has been abandoned because it upset digestion and defeated its own purpose. Large quantities of eggs and milk are not now considered necessary, but a well-balanced ample ration is of the greatest importance.

EMPLOYMENT OF THE TUBERCULOUS.

After the disease is arrested most cases must return to work. The question of employment for tuberculous people is the most serious confronting students of tuberculosis. It is one of the big problems confronting district vocational officers. For years the whole subject has been chaotic, but fortunately ideas developed by experience are crystallizing. There are certain principles that can be laid down as fairly well established to which district vocational officers should give careful consideration.

Many patients are still being told by physicians that they must seek "light outdoor employment." This is a fallacy. Experience has demonstrated that most arrested cases, especially those who have been accustomed to indoor work, will do better if they return to indoor jobs. Moreover, there are few outdoor jobs that are suitable for the tuberculous, as will be shown presently. There are many suitable indoor jobs.

As a general rule, it is better for a man with arrested tuberculosis to return to his old occupation than to learn a new trade or profession. If the particular job is unsuitable, then some job in which previous training can be utilized should be sought. Occasionally it may be found necessary to advise complete readjustment of occupation.

Everyone concerned wants to know what occupations are suitable and what are unsuitable. Lists of industries and jobs have been given with each industry or job in one or the other column. They are unsatisfactory, for opinions will differ concerning the classifications. We know of very few industries that can be said to be wholly

unsuited for the tuberculous. The various industries are made up of few or many jobs, some of which will be found suitable and some unsuitable. For example, there are about 190 operations in the boot and shoe industry; 52 in the manufacture of light clothing, shirts, and overalls; 50 or more jobs in the printing trades; 11 jobs in surveying, etc.

A tuberculous man could not be a surveyor's axman in an unexplored mountainous region, but he might very successfully act as a chainman in proving land in a settled country. Another might be advised against returning to the job of compositor who could well learn to operate the monotype keyboard.

The tuberculous should not enter occupations which are conducted underground, which are dusty (particularly if the dust is inorganic), which involve handling poisons or produce fumes and gases, which require severe physical strain, mental stress, or emotional excitement.

Such a statement, however, is not a sufficient guide for vocational advisers in counseling soldiers for retraining and placement. The problem must be approached from a different angle.

The vocational advisers and the medical officers in the various districts must sit down with the individual soldier and help him to decide wisely about his future. They will have to advise about a particular job for his case. The vocational officers will know little or nothing about tuberculosis, but will know about jobs and processes. The medical officers will know little or much about tuberculosis, depending upon their training, and they will probably know little about industries. But if we can lay down a set of standards by which to judge the inherent and extrinsic health factors of a job they can more nearly approximate a wise judgment.

OCCUPATIONAL HEALTH STANDARDS.

The following standards¹ cover nearly, if not quite all, the health factors that will enter into the problems of training and placement. Not all will have a bearing on every case, but all the cases met will involve most of them.

A few explanatory comments are given to make the subject clearer:

Group 1—Factors due to the personality of the worker.

(a) Present health: The amount of damage done by and the degree of arrest of the tuberculous disease, as shown by the medical survey, should be carefully considered.

(b) Temperament and education: Is he "high strung" or phlegmatic, stupid or quick of perception? The extent and direction of the man's education, both in school and by experience, will enter into the choice of training course and job.

¹ Adapted from those devised by Dr. Geo. M. Price in "The Modern Factory."

(c) Choice of vocation and trade: It is a cardinal principle that the man shall be consulted as to his hopes and ambitions; that previous experience shall be utilized whenever possible in retraining. This holds true for tuberculosis as for other disabilities.

(d) Age will have a direct bearing on training. One soldier with only a common-school education who had been a warehouseman wanted at the age of 39 to become a minister. The vocational adviser convinced him that his education was too limited and his age too advanced to undertake training for the ministry.

(e) The soldier would not, of course, be directed to a trade largely followed by women.

Group II—Factors due to conditions of work.

(a) Character of work: Active or sedentary; heavy or light, involved and complicated, or simple as to operation; per diem or piecework.

(b) Attitude and position: Sitting, standing, stooping. An occupation requiring a continuous stooping or strained position would be unsuitable.

(c) Time, duration, and pauses: Day or night work, the latter usually unsuitable. The work should not be seasonal, requiring intensive application at certain times of the year, as the canning industry. Speeding up at the end of each month, as is frequently done by bookkeepers, might prove serious. The tenure of employment should be reasonably certain.

Hours of work: Eight or less, suitable; nine or more, unsuitable.

Pauses: Lunch hour imperative and brief rest periods desirable.

(d) Fatigue, tension, and responsibility: Lifting heavy weights or any work requiring vigorous exertion of the upper extremities, especially if long continued, should be avoided. Severe bodily effort, continued nerve strain, and too much responsibility are dangerous.

(e) Wages must be adequate for the healthful support of the man and his family.

Group III—Factors due to materials and processes.

(a) Dusts, (b) poisons, (c) gases and fumes: Their kind and quantity must be taken into account. They may act as direct irritants to the throat and lungs or lower the general "tone," thus leading to breakdown.

(b) Infectious material: This will not affect employment in well-conducted sanatoria where infectious material is properly disposed of.

(c) Dangerous machinery and appliances affect the tuberculous no differently than other employees except as nervous strain contributes to breakdown.

Group IV—Factors due to the place of work.

(a) Outdoor and indoor work: This has already been discussed. These cases should not work in strong drafts nor high winds, under a burning sun, in superheated shops, greenhouses, etc., nor in slush and rain.

(b) Construction of work place: Flooring is an important item. Damp or wet floors are unsuitable places. Basements, underground jobs, and overcrowded shops should be avoided.

(c) Air and ventilation, temperature and humidity: Frequent changes in shop air are imperative for the health of all workers. In artificially heated places of work and abode the most desirable temperature range is 65° to 70° F. The minimum for the tuberculous should be 55°. The maximum should not exceed 75°. Relative humidity for these temperatures should not be below 30 per cent or above 60 per cent.

(d) Light and illumination: The amount and intensity of light suitable for the kind of work to be done should be determined. This, however, is a matter of shop inspection for the placement officer, and it is suggested that he study the lighting codes of those States that have adopted such a code.

(e) Sanitary care and comforts: Drinking, washing, and toilet facilities of approved types. (See Appendix.) Club and rest rooms desirable. Employers who have developed a department of industrial medicine will be more likely to have a sympathetic and helpful attitude toward the tuberculous workers.

To recapitulate and place these factors in outline for ready reference they are presented as follows:

OCCUPATIONAL HEALTH FACTORS FOR THE TUBERCULOUS.

Group I—Factors due to the personality of the worker.

- (a) Present health.
- (b) Temperament and education.
- (c) Choice of vocation and trade.
- (d) Age.
- (e) Sex.

Group II—Factors due to conditions of work.

- (a) Character of work.
- (b) Attitude and position.
- (c) Time, duration, and pauses.
- (d) Fatigue, tension, and responsibility.
- (e) Wages.

Group III—Factors due to materials and processes.

- (a) Dusts.
- (b) Poisons.
- (c) Gases and fumes.
- (d) Infectious material.
- (e) Dangerous machinery and appliances.

Group IV—Factors due to the place of work.

- (a) Outdoor and indoor.
- (b) Construction of work places.
- (c) Air and ventilation; temperature and humidity.
- (d) Light and illumination.
- (e) Sanitary care and comforts.

To use this set of standards intelligently it will be necessary to have lists of occupations, with a brief but comprehensive description of the activities or operations which characterize each occupation.

The United States Bureau of Labor Statistics has already issued several such lists, and these have been sent to the district offices. Others will be sent as they appear. The Trade Specifications and Occupational Index of the United States Army (Form CCP-504) will also prove useful.

Let us see how this plan works out with a hypothetical case. A man who has been six months in a civilian sanatorium presents himself at the district office at New York City, which is his home, and says he wants to get some training to pass the examination for police officer. He is 30 years old, has had a 2 years' high-school education, and before being drafted was doing outdoor work in a shipping room "rustling" heavy boxes. He was in the Army four months, and had a rather copious hemorrhage following a 16-mile practice "hike." He was sent to the base hospital, where tubercle bacilli were found in his sputum. After a certain period he was honorably discharged from the service on a surgeon's certificate of disability, and was awarded compensation by the Bureau of War Risk Insurance. Later he went to Fort Stanton, where he had six months of treatment. His survey sheet shows that his sputum has been negative for four months; that the disease is inactive; that the lesion is in the right apex; that there is considerable dullness to the second interspace. The case board sitting on this case wants to determine whether this man ought really to seek appointment as policeman. Discussing the man's personal habits, general education, temperament, etc., the board finds that they are satisfactory. In discussing the duties of a policeman to find out how they might affect a man's health they recall that the policeman walks a beat either by night or by day as directed by his chief; that the work is mostly out of doors, but of necessity must be in all kinds of weather—hot, cold, or wet. He must handle traffic at congested street intersections, which involves a nervous strain. He must at times pursue criminals, sometimes up several flights of stairs or over back-yard fences. This not only involves undue physical effort, but involves emotional excitement. It is also noted that the candidate for the police force must undergo a severe physical test.

It seems almost certain that a case board would determine that such a job would be unsuited to this man. Yet "policeman" is given by several authors as a suitable occupation for arrested cases of tuberculosis.

But the man in this case interposes and says he can be detailed as a sanitary officer; that he will have regular hours of day work; will be under direction of the commissioner of health (a physician); will be able to control somewhat his activities according to weather conditions and will rarely make an arrest except for infraction of the sanitary code (he usually delivers a summons or subpoena); or he may be assigned to police duty on the floor of one of the big banks, where his hours of duty, from 8 a. m. to 4.30 or 5 p. m., will be consumed by walking about in a large, well-ventilated, well-lighted, and open building, giving directions to patrons and doing guard duty. This work is regular, likely to be permanent, and returns a good living wage.

It is at once concluded that either of these special police assignments would be good for this man, and it is decided to help place him, giving him such training as may be necessary to meet the civil service requirements. The placement officer will also interview the medical examiner of the police board to see that the man is not put through too severe a physical test.

One more example for the vocational adviser—an actual case, with name and places changed:

Smith, M. J.; age, 44; married and has two children; was a journeyman plumber when he enlisted in the Navy, and was living in the city of Providence, R. I. He broke down October, 1917, and was treated in a naval hospital. After six weeks he was discharged and sent home. Last March the War Risk Bureau sent him to the sanatorium at Westfield. He has gained 40 pounds and is a large, healthy looking man, but, nevertheless, has a cavity in the upper lobe of the left lung. He will require at least six months more of sanatorium treatment. Even then he will not be able to handle a pipe wrench, to cut threads, lift plumbing supplies, etc. The man wants to do something more than weave baskets during the next six months, and he needs training to return to gainful industry. He is 44 years of age, has only a common-school education, and does not appear particularly quick of perception, so that a new trade is hardly to be thought of. And, moreover, one of our basic principles in vocational training is to make use of previous experience. Is it not possible, therefore, to give this man a course in simple mathematics, blue-print interpretation, laying out of jobs, estimation of costs, etc., to the end that he may become a contractor's foreman, or, if he has sufficient capital, a small contractor himself?

Concerning the vocational training of active cases, the Federal Board has taken the position that vocational training will be offered only to arrested cases. This does not include occupational therapy and prevocational training being provided for men in sanatoria. It is the duty of the district vocational officers to use every art of persuasion to get active cases to accept sanatorium treatment.

It has been said that there are some cases of tuberculosis that appear to remain in a stationary condition for years and yet have tubercle germs in their sputum. Sanatorium treatment would accomplish little for these, and many of them can work. Shall the vocational officers help to place in industry any such cases found among discharged soldiers? If they have been declared fit for work by a competent physician, the answer is "Yes." It is a duty we owe the public to help find suitable employment for these men where they will not be a menace to those about them. If we do not help them, they will seek jobs for themselves and will almost certainly conceal the fact that they are open cases of tuberculosis.

It must be kept in mind that any occupation for a tuberculous man must be considered in the nature of an experiment. He should be kept under medical supervision and the effect of the work watched closely and proper modifications made from time to time.

The way the man with arrested tuberculosis spends his leisure hours most often determines his continued well-being. To "square" the 24 hours of the day with good health they should be divided into three equal parts—8 hours for work, 8 for rest and recreation, and 8 for sleep. Even this wise division of the day must be flexible for the tuberculous. It will be found that some of them can not work 8 hours; none should work longer. Some will require 9 or 10 hours' sleep.

The choice of amusements should be determined by the character of the occupation which fills the working hours. Those engaged in active operations should seek quiet, restful recreation; those in sedentary jobs would doubtless get the most good from some moderately active outdoor sport.

FOLLOW-UP SERVICE.

It will be readily seen that some "follow-up service" must be offered these cases, some friendly supervision that shall not be officious. It is neither necessary nor desirable for the Federal Board to develop a social-service department of its own. It is very desirable, however, to establish cooperative relations with all existing agencies in the respective districts. There are antituberculosis associations, public-health nurses, dispensaries, industrial physicians in shops, Red Cross home-service workers, etc., all of whom can be of

help to the Federal Board in fostering and safeguarding the welfare of tuberculous soldiers.

The National Tuberculosis Association, 381 Fourth Avenue, New York City, will be able to give information about local agencies and to supply literature. The following pamphlets will be supplied in limited quantities, free of charge:

What You Should Know About Tuberculosis.

Sleeping and Sitting in the Open Air.

Any of the following popular books on tuberculosis can be secured through the Journal of the Outdoor Life, 381 Fourth Avenue, New York City.

Rules for Recovery from Pulmonary Tuberculosis, by Dr. Lawrason Brown.

Consumption, a Preventable and Curable Disease, Dr. L. F. Flick.

T. B. Playing the Lone Game, Consumption, by T. G. Galbreath.

Consumption, What It Is, and What to Do About It, by John B. Howes, 2d, M. D.

The Battle with Tuberculosis and How to Win It, by Dr. MacDougal King.

Tuberculosis: Its Cause, Cure, and Prevention, by Dr. E. O. Otis.

APPENDIX.

SANITARY STANDARDS ADOPTED BY THE COMMITTEE ON SHOP AND INDUSTRIAL SANITATION OF THE COUNCIL OF NATIONAL DEFENSE.

DR. GEO. M. PRICE, *Chairman of Subcommittee.*¹

[These sanitary standards are applicable only to factories and shops where the workers do not handle industrial poisons, it being understood that special provisions for such processes and workers are to be made under other standards.]

I.

DRINKING WATER.

1. GENERAL PROVISION.

There shall be provided in every factory for the use of employees a sufficient supply of wholesome cool drinking water.

2. LOCATION.

Drinking-water facilities should be provided on every floor of factory buildings in accessible places.

3. FOUNTAINS.

Wherever practicable drinking water should be provided through bubble fountains or inverted spigots, so constructed that a person may drink from the stream or jet of water without touching his lips or mouth to the metal part of the fountain.

4. RECEPTACLES.

Whenever drinking water is placed in receptacles these shall be constructed of metal or glazed earthenware and provided with cocks and spouts and properly covered so as to prevent contamination; also cleaned at frequent intervals.

5. DRINKING CUPS.

No common drinking cups or glasses should be permitted. Paper cups or individual glasses should be used.

II.

WASHING FACILITIES.

1. GENERAL PROVISION.

In every factory there shall be provided and maintained for use of the employee suitable and convenient washing facilities, separate for each sex, provided with running water and consisting of single

¹ Approved by the advisory committee of the National Tuberculosis Association as shop standards for tuberculous workers.

or trough sinks without plugs, or stationary basins, of a material easily cleansable and maintained in good condition.

2. LOCATION.

Washing facilities shall be conveniently located in accessible places.

3. NUMBER.

There shall be provided at least one sink or stationary basin with hot and cold water, for every 10 employees, or at least 2 feet of trough sinks for every 10 employees, or a perforated pipe with a continuous flow.

4. FLOORS.

The floors under the basins and sinks shall be kept in good repair and in good condition.

5. TOWELS.

The use of roller towels or any towel in common is prohibited. Paper or individual towels should be used.

6. RECEPTACLES FOR SOILED TOWELS.

Whenever paper towels are provided, receptacles for such towels shall be provided.

III.

TOILET FACILITIES.

1. GENERAL PROVISIONS.

Toilet facilities shall be provided in accordance with the following standards:

2. APARTMENT.

(a) *Location*.—All toilets shall be located conveniently to and easily accessible from, all places where persons are employed.

(b) *Separation*.—Toilet rooms for each sex shall be maintained separate and apart from each other and from all workrooms and passageways. Such rooms shall be marked so as to designate plainly and distinctly for which sex they are intended.

(c) *Screening*.—If the water-closet is not located within a separate screened compartment in the toilet room, the entrance to all toilet rooms shall be provided with a screen to insure privacy. This screen shall be at least 6 feet in height, and shall extend to within at least 4 feet of the floor, and, if the space permits, shall be not less than 2 feet wider than the door leading into such toilet room.

(d) *Distance*.—All toilet rooms not having sewer connections and maintained outside of buildings, where people are employed, shall be at least 25 feet from such buildings, and in all factories where the workers are exposed to excessive heat, humidity, or fatigue from physical exertion, there shall be a covered passageway connecting said building with toilet or toilets.

(e) *Construction*.—The outside partitions of all toilet rooms shall be of solid construction, and made opaque or translucent, but not transparent, and shall extend from floor to ceiling, or such rooms shall be independently ceiled over. All partitions separating toilet rooms provided for the different sexes shall be at least 2 inches in thickness and constructed of such materials as are not transparent or translucent, and they shall be sound proof and no openings in such partitions shall be permitted. Where more than one water-closet is provided in one toilet room each water-closet shall be in a separate compartment provided with a door. The partitions and the door shall be composed of material that is opaque or translucent, but not transparent. The tops of the doors and of the partitions shall be carried either to the ceiling or to a height of 7 feet from the floor; the bottoms of the doors and the partitions shall not be more than 4 inches from the floor.

(f) *Floors*.—The floors of all toilet rooms shall be tight, smooth, and constructed of a substance that shall be impervious to moisture.

(g) *Walls*.—The walls of all toilet rooms shall be tight and of a substance that can be readily cleaned and kept clean.

(h) *Ceilings*.—The ceilings of all toilet rooms shall be tight and of a substance that can be readily cleaned and kept clean.

(i) *Light*.—All toilet rooms and water-closet compartments shall be adequately illuminated by natural or artificial light.

(j) *Ventilation*.—All toilet rooms not lighted by windows that open easily shall be adequately ventilated to the outside air by artificial means. Every water-closet compartment entirely separated from the remainder of the toilet room by partitions extending from the floor to the ceiling and not provided with a window opening easily shall be adequately ventilated to the outside air by artificial means.

Every toilet room or every water-closet or urinal compartment shall have a window opening directly to the outside air. No such window shall be less than 1 foot wide nor have an area of less than 6 square feet, measured between stop heads, for one water-closet or urinal. For every additional such fixture the area of such window shall be increased at least 1 square foot. A skylight shall be deemed the equivalent of a window, provided that it has fixed or movable louvers with openings of the not openable area prescribed for such window.

Every such window shall be open upon a street or upon a yard or open space, uncovered at the top, which in its least horizontal dimension shall be at least one-tenth the height of the highest abutting wall, but in no case less than 6 feet.

(k) *Heating*.—All toilet rooms and water-closet compartments shall be adequately heated at all times.

(l) *Cleanliness*.—The occupier shall be responsible for the maintenance of all toilet rooms or water-closet compartments in a clean and sanitary condition.

3. FIXTURES.

(a) *Kind*.—The use of any form of trough water-closet or latrine or school sink is prohibited; individual closets shall be provided. The bowls of all water-closets shall be smooth, impervious material. Pan, plunger, wash-out, faucet, and long hopper closets are not permissible. The seat shall be finished with a smooth, impervious, waterproof substance.

(b) *Connections*.—The disposal of all contents of toilets and urinals shall be in accordance with the laws, rules, and regulations of the State and municipal health authorities of the locality in which they exist.

Privies shall not be permitted except in cases outside of the sewer zone, and where cesspool or septic tank can not be used privies not connected with the sewerage system shall be built in accordance with the standards recommended by the United States Public Health Service.

Provisions shall be made for the adequate flushing of every water-closet.

(c) *Number and ratio*.—Water-closets shall be provided in accordance with the following table:

Number of persons.	Number of closets.
1 to 20.....	1
21 to 40.....	2
41 to 60.....	3
61 to 80.....	4
81 to 100.....	5
101 to 150.....	6

For each additional 30 persons, at least one additional water-closet shall be provided.

4. URINALS.

(a) *Kind*.—Urinals provided shall be either individual urinals or slab urinals. At least 2 feet of slab urinal shall be considered the equivalent of one individual urinal.

(b) *Construction*.—Urinals shall be composed of smooth material impervious to moisture.

(c) *Connections*.—All urinals shall be connected by waste pipes to sewers or cesspools, which sewers or cesspools shall be constructed in accordance with the laws, rules, and regulations of the State and municipal health authorities of the locality in which they exist.

Unless water runs continuously over the walls of the urinal each urinal shall be provided with an adequate water flush. When individual tanks are used, the flushing shall be accomplished by pedal action.

(d) *Number and ratio.*—Where more than 10 males are employed at any one time, urinals shall be supplied according to the following table:

Number of men.	Number of urinals.	Or feet of slab urinal.
10 to 50.....	1	2
31 to 60.....	2	4

For each additional 50 men employed at least one additional urinal or 2 additional feet of slab urinal shall be supplied.

The above standards shall apply in all cases except where Federal, State, or municipal laws, rules, or regulations of more restrictive character are applicable; in such instances, the more restrictive laws, rules, or regulations shall apply.

PUBLICATIONS OF THE FEDERAL BOARD FOR VOCATIONAL EDUCATION.

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***Bulletin No. 2. Training Conscripted Men for Service as Radio and Buzzer Operators in the United States Army (International Code).**

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All communications should be addressed to

The Federal Board for Vocational Education, Washington, D. C.

***Emergency war training for conscripted and enlisted men.**

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TRADE AND INDUSTRIAL
SERIES No. 5

EVENING AND PART-TIME SCHOOLS IN THE TEXTILE INDUSTRY OF THE SOUTH- ERN STATES

*Issued by the Federal Board for
Vocational Education*

WASHINGTON, D. C.
APRIL . . . 1919

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FOREWORD.

At the request of the office of the Federal Board for Vocational Education, the Southern Commercial Congress called a conference in the City of Atlanta for the purpose of discussing the possibilities of applying the Federal vocational education act to the textile industry of the South.

This conference held on August 13 and 14, 1918, was attended by southern cotton mill officials, and representatives of the Southern Commercial Congress; by representatives of the State board for vocational education, and by representatives of the Federal Board for Vocational Education.

At the close of the conference it was unanimously agreed that an investigation or survey of the needs and possibilities of training for the textile industry should be made by the Federal Board and that training centers should be established in the mill cities of the different States in which to try out experimental classes in evening and part-time schools.

It was further agreed that the resulting report as contained in this bulletin should deal largely with the training classes so established.

The work was carried on under the direction of Mr. Roy Dimmitt, agent of the Federal Board for Industrial Education in the South. With him there were associated Mr. William G. Blair, a textile superintendent of large and successful experience, and Mrs. Anna L. Burdick, agent of the Federal Board for Industrial Education of Girls and Women. Mr. Blair dealt with the practical and technical training for the textile business and Mrs. Burdick with general continuation classes. Mr. Dimmitt assumed the responsibility for other types of part-time and evening classes; of organizing the experimental centers and of writing this bulletin as a formal report.

At the request of the office of the Federal Board, President Draper, of the American Cotton Manufacturers' Association, appointed a special advisory committee of textile officials to assist Mr. Dimmitt in this work. This committee consisted of the following:

Mr. Fuller E. Callaway, Lagrange, Ga.

Mr. John L. Patterson, Roanoke Rapids, N. C.

Mr. L. L. Arnold, Atlanta, Ga.

Mr. B. E. Geer, Greenville, S. C.

Mr. Allen F. Johnson, Atlanta, Ga.

The plan for the work was approved by this committee and the office of the Federal Board in December and furnished the basis for the field work and this report. The final report was also submitted to the committee for approval before being adopted by the Federal Board.

The technical matter was further submitted to a committee composed of practical cotton-mill superintendents and to the faculty of

the southern textile schools for criticism and revision. These cooperating advisory committees were especially helpful, and their suggestions and revisions were for the most part incorporated in the final form of this report.

The field work and report covers the following Southern States: Virginia, North Carolina, South Carolina, Tennessee, Georgia, Alabama, Mississippi, Louisiana, Arkansas, Texas, Kentucky, Oklahoma, and Missouri.

Through the hearty cooperation of the State boards of North Carolina, South Carolina, Georgia, and Alabama there have been established 40 courses of instruction, comprising 52 separately organized classes, in cooperation with 24 textile manufacturing plants in 13 different cities.

Special acknowledgment for valuable assistance in one form or another is made to Judge Robert W. Bingham and Clarence Owens, president and director, respectively, of the Southern Commercial Congress, to Mr. W. D. Adams, secretary National Textile Manufacturers' Association, and to the following committee and representatives of southern textile colleges:

COMMITTEE OF MILL REPRESENTATIVES.

Mr. George H. Lanier, president West Point Manufacturing Co., Lanett, Ala.

Mr. S. Y. Austin, general manager Hillside Cotton Mills, Lagrange, Ga.

Mr. W. S. Dean, superintendent Roanoke Mills Co., Roanoke Rapids, N. C.

SOUTHERN TEXTILE COLLEGES.

Prof. Chas. S. Doggett and textile faculty of Clemson College, South Carolina.

Prof. Carl B. Seal and textile faculty of Georgia School of Technology.

Prof. Thomas Nelson and textile faculty of North Carolina Agricultural and Engineering College.

Prof. J. B. Bagley and textile faculty of Texas Agricultural and Mechanical College.

This bulletin is directed to mill and school officials with the hope that it may be of large service to them in their mutual task of providing general and vocational training for the textile workers in a rapidly growing industry.

Such training is equally necessary for the textile workers of all sections. The study and the recommendations are in most respects equally pertinent to the cotton textile business as a homogeneous industry. While this work was undertaken in response to the urgent request of southern mill and school officials, it may be adapted for use everywhere and will be followed by the attempt to secure in other regions the establishment of centers of training.

C. A. PROSSER, *Director.*

EVENING AND PART-TIME SCHOOLS IN THE TEXTILE INDUSTRY OF THE SOUTHERN STATES.

Part I.—APPLICATION OF THE FEDERAL VOCATIONAL EDUCATION LAW TO THE TEXTILE INDUSTRY.

1. IMPORTANCE OF THE INDUSTRY IN THE SOUTHERN STATES.

Cotton manufacturing clearly stands out as the most important industry in several of the Southern States. It is only natural that the cotton-producing section should consume its product in manufacture. The industry should therefore figure largely in the program of vocational education in those States where it is so important a factor. Another justification for thus giving consideration to the work in this section is that it is a growing industry and its development has by no means reached its maximum. During the past 15 years, according to the committee on statistics of the National Association of Cotton Manufacturers, the number of cotton mills in the South has increased 69 per cent; the number of employees 66 per cent; the value of the product 199 per cent; in 20 years the increase in cotton consumption was 298 per cent. The figures representing the increase in other sections of the country are small compared with those for the South. Each year since 1840 has shown a decided increase in cotton spindles in the cotton-growing States, reaching about 15,000,000 in 1918. According to the United States Census Bureau, for the year ending July 31, 1917, the consumption in the cotton-growing States formed 56.6 per cent of the total for the country; that in the New England States 34.7 per cent, and that in all other States 8.7 per cent.

In view of the importance and growth of the industry the State boards for vocational education in the Southern States will give due consideration to the textile industry in formulating plans for industrial education if the local industrial needs are to be met and industrial workers in greatest numbers benefited. The brief investigation which brought about the publication of this bulletin has shown a great willingness and desire on the part of the mill interests to cooperate in this special field of education.

2. THE VOCATIONAL EDUCATION LAW.

The Federal Vocational Education Law (Smith-Hughes Act) is the result of legislation on the part of the Federal Government which provides funds out of the National Treasury for cooperation with the several States in promoting a kind of education which is much needed and which has been much neglected, namely, vocational education.

(A) THE PURPOSE OF THE ACT.

The vocational act was brought about for the purpose of stimulating States to promote vocational education in the fields of agriculture, trade, home economics, and industry. Its specific aim is to make efficient wage earners. This may be done by preparing persons for new occupations or by increasing the skill and knowledge of those who have already entered a chosen vocation. The act is exceedingly broad in its scope and makes provision for the boys or girls who are yet in attendance upon school in the form of day trade school, and for those who have entered employment by evening and part-time schools or classes. Emphasis is placed on the fact that the act is not intended for general academic education, as it is assumed that the States are already making ample provisions for the education of their youth along general lines. Consideration is given to the common wage-earning occupations and the instruction for which Federal funds are received should adequately prepare persons for, or improve persons in, such employment.

(B) CLASSIFICATION OF TEXTILE EMPLOYMENT.

As previously indicated, three main divisions in the vocational act provide for vocations to be found in agricultural, home-making, and trade or industrial pursuits. It is obvious that the production of cotton will naturally fall under the classification of agriculture, and that the consumption of cotton in manufacturing processes is to be classed as a trade or industry. Within the cotton manufacturing industry are to be found several trades, some of which deal directly with the production of cloth from raw material, such as carding, spinning, and weaving. Others are subsidiary to the actual production but are necessary adjuncts in the manufacturing process, such as designing, machine-shop practice, etc. Any, or all, of these occupations fall within the provisions of the law, and classes organized for the benefit of workers in these lines are subject to Federal aid provided they are organized in compliance with the terms of the State plan of the State in which they are located.

(C) APPLICATION OF VOCATIONAL EDUCATION LAW TO TEXTILE EDUCATION.

Inasmuch as the occupations connected with, and as a part of, the textile industry are classified as trade or industrial, it follows that any scheme of educational training which is designed to prepare persons for these occupations, or which will increase the industrial efficiency of such workers, may come under the provisions of that part of the act which deals with trade and industrial education.

Textile instruction may be given in what is termed (1) the unit-trade day school for those who wish to enter the industry and desire preparation in advance for such work, (2) evening schools, or classes for those already engaged in cotton-mill work, and who have the opportunity for obtaining such instruction only outside of working hours, and (3) part-time schools or classes for those who have the privilege of securing textile instruction during working hours.

It is apparent that the fields offering the greatest opportunities for applying Vocational Education Law to textile education are in evening and part-time classes held in the immediate vicinity of the mills, or better still under the mill roof. In fact, the Federal Board is not in a position to recommend at the present time that communities be put to the enormous expense of providing a plant and equipment for establishing the day school in the South for the preparation of textile workers, owing to the fact that few, if any, communities in the South have cotton mills and textile workers in sufficient numbers to justify such expense. It is evident, however, that in any community where there are textile workers in considerable numbers, the plant and equipment of the mills in operation may be used to advantage in giving instruction of a practical nature to employees through part-time or evening classes. Suggestions for such instruction will be given in subsequent sections of this report.

(D) POSSIBLE FUNDS AVAILABLE FOR TEXTILE EDUCATION.

For the whole program of vocational education in the United States, Congress has appropriated in round numbers \$7,000,000 annually. This total amount is to be used for the teaching of agricultural subjects, trade, and industrial and home economics subjects, and for the preparation of teachers of these subjects. The apportionment is made to the States on the basis of population, differing in its manner for the several lines of work. That part of the appropriation which may be used for textile education will necessarily come from the trade and industrial fund of any State. The Federal appropriation is on a graduated scale, the amount increasing year by year until 1926, at which time the maximum is reached. After this the annual appropriation is the same as for 1926. At this time the trade and industrial funds, from which textile instruction may receive subsidy, vary in the several Southern cotton manufacturing States from \$14,000 to \$99,000 annually. Inasmuch as the States are required to match the Federal funds in their application to vocational education, double the amounts indicated will be available. The magnitude of these funds justify the textile industry in seeing to it that it is properly taken care of in any distribution which looks to the vocational education of industrial workers. The following table shows the amounts available for the States indicated:

12 SCHOOLS IN TEXTILE INDUSTRY OF SOUTHERN STATES.

Federal funds available for salaries of teachers of trade, home economics, and industrial subjects under the Vocational Education Law in the Southern cotton-manufacturing States.

States.	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25	1925-26
Alabama.....	\$6,569.11	\$8,758.82	\$10,948.52	\$12,138.23	\$15,327.93	\$17,517.64	\$21,897.05	\$26,276.46
Arkansas.....	5,000.00	5,000.00	5,990.47	7,178.57	8,376.66	10,000.00	11,980.95	14,377.14
Georgia.....	9,552.27	12,736.36	15,920.45	19,104.54	22,288.63	25,472.72	31,840.90	38,209.08
Kentucky.....	9,850.05	13,133.40	16,416.75	19,700.10	22,983.45	27,266.70	32,833.50	39,400.20
Louisiana.....	8,805.07	11,740.10	14,675.12	17,610.15	20,545.17	23,480.20	29,350.25	35,220.30
Mississippi.....	5,000.00	5,000.00	6,127.32	7,352.79	8,578.25	10,000.00	12,254.65	14,705.56
Missouri.....	24,806.22	33,074.96	41,343.70	49,612.44	57,881.18	66,149.92	82,687.40	99,224.88
North Carolina.....	5,647.72	7,530.30	9,412.87	11,295.45	13,178.02	15,060.60	18,825.75	22,590.90
Oklahoma.....	5,677.54	7,570.06	9,462.57	11,355.09	13,247.60	15,140.12	18,925.15	22,710.18
South Carolina.....	5,000.00	5,316.14	6,645.17	7,974.21	9,303.24	10,632.28	13,290.35	15,952.42
Virginia.....	8,450.62	11,267.50	14,084.37	16,901.25	19,718.12	22,535.00	28,168.75	33,802.50
Tennessee.....	7,821.37	10,428.50	13,035.62	15,642.75	18,249.87	20,857.00	26,071.25	31,285.50
Texas.....	16,636.06	22,181.42	27,726.77	33,272.13	38,817.48	44,362.84	55,453.55	66,544.26

NOTE.—The Federal law requires that one-third of the appropriations be spent for part-time instruction.

All Federal funds must be matched by State or local funds, thus making available for salaries of teachers double the amounts given in the above table.

In most of the States the State boards for vocational education allot 20 per cent of the amounts above mentioned for home economics education.

3. ADMINISTRATION AND ORGANIZATION OF TEXTILE CLASSES.

In the organization of textile classes or schools consideration should be given to certain conditions which are common to all State plans. As applied to textile education in part-time and evening classes, these conditions may be briefly summarized as follows:

- (1) The classes must be under public supervision or control.
- (2) The controlling purpose of the instruction must be to further fit for useful employment.
- (3) The instruction must be less than college grade.
- (4) The minimum age for pupils is 14 years for part-time instruction, and 16 years for evening instruction.
- (5) Federal money obtained through the State boards can be used only for the payment of salaries of teachers. Equipment, supplies, and other forms of maintenance are to be provided for aside from Federal funds.

(6) Every dollar of Federal funds expended must be matched by an equal amount of public funds from the State or local community. In other words, one-half of the teachers' salaries may be paid from Federal appropriation, the other half being provided for by State or local money. In many of the classes organized for the purpose of trying out the plans suggested in this bulletin, the local mills made appropriations to the local public school boards to supplement the funds available for public instruction. The funds thus matching the Federal money were provided in part by private interests, but administered through the public boards. This cooperation between the

local school boards and the textile interests is also desirable for reasons other than merely financing the project.

(7) In the evening textile school the instruction must be supplementary to the daily employment of textile mill workers. Trade instruction, therefore, rather than general or academic instruction, constitutes the work of the evening school.

(8) In the part-time school either trade instruction or general instruction may be given.

(9) The school is organized on the basis of a minimum length of 144 hours of instruction during the year.

(A) AGENCIES OF COOPERATION.

(1) *The Federal Board.*—The Federal Board for Vocational Education is charged with administering the Federal vocational act. Its work, however, is limited to cooperating with the State boards for vocational education provided for in the act and the various State plans. The Federal Board does not deal directly with local schools or institutions. It approves the plans set up by the State boards for promoting vocational education in the several States, but leaves the matter of administering the State plans to the State boards.

(2) *State boards for vocational education.*—The Federal law makes provisions for a State board to set up plans and administer the law within the borders of the State. The State board deals with individuals, local schools or institutions with reference to all matters pertaining to vocational education under the act. All applications for information, Federal and State aid, and all proposals for cooperation in the vocational education program should, therefore, be directed to the State board for vocational education rather than to the Federal Board at Washington. Such a board has been created in each of the Southern cotton-manufacturing States, and is ready to cooperate with local boards and cotton-manufacturing plants in the organization of part-time and evening classes for the benefit of their industrial workers.

(3) *The local public board.*—One of the conditions which governs the organization of schools or classes for textile workers under the Federal act is that the instruction shall be under public supervision or control. It is evident therefore that a local public board is needed to administer the work in any given community. This local board may be the city board of education, the county board of education or a district board. It is even possible for the State board to act in the capacity of a local board in cases where it is thought necessary or advisable. The local board deals with the State board in making arrangements for conducting vocational classes. It makes proposals of plans, applications for aid and reports on existing classes to the State board. It also directs and supervises the local instruction.

(4) *The local textile interests.*—Whether the initiative for organizing textile classes is taken by the local educational authorities, the local textile manufacturers, or the local textile workers, it is very essential that school and mill organizations set up a scheme of cooperation. The school authorities can accomplish little without the cooperation and backing of the employers whose workers are being instructed. On the other hand, the mills need the school authorities as a medium for having the things done which need to be done educationally for their workers. Again, the millmen better know the needs of the community and are in a position to technically advise and guide the school authorities if the right sort of cooperation is established between the two interests. The responsibility of providing the right kind of instruction and of otherwise making a success of the undertaking should be shared equally by school and mill officials. The school board should see to it that an advisory committee representing the cotton mills is appointed to cooperate with it whenever vocational classes are attempted. These boards should hold regular meetings for the purpose of discussing ways and means of making a success of the undertaking.

(B) PROCEDURE IN ESTABLISHING LOCAL TEXTILE CLASSES.

In the establishment of textile classes in any community certain definite steps should be taken to put the work on a substantial basis, and to make sure not only that the right kind of instruction is determined upon for the industrial needs of that community but that the work is organized and carried out with a view of securing the best results. The following procedure is suggested for the guidance of local school boards or mill officials in establishing evening or part-time textile classes:

(1) *Local survey as to need for textile education.*—Not all communities are in need of programs for vocational or industrial education. In others a need may exist but the number of workers may be too small to justify the organization of such a program. It is safe to assume, however, that any community in the South in which a cotton-mill exists, is in need of some kind of organized effort to improve either the vocational or civic intelligence of the cotton-mill operatives. This does not mean that all mill workers in the South are in need of such instruction, but that many can be found in every cotton-mill community who could profit by systematic training.

A local survey, or investigation, to determine the educational status of employees is the first step in this educational program. This investigation may or may not be a formal one. It may consist merely of personal interviews during working hours. School and mill officials may know from previous experience and contact with employees that instruction along certain lines is needed. All that is meant by such a survey is that it be determined (a) if instruction is

needed, (b) the kind needed, and (c) the type of school or class most suitable for furnishing such instruction.

(2) *Determination of type of instruction.*—The kind of courses to be offered will be determined by the needs of local employees and the needs of the mills. A general shortage of loom fixers on the part of the mill would at once show that such instruction as would increase the number of trained workers of this type should be given. On the other hand, if the number of loom fixers was sufficient but the quality of their work inferior, this again would indicate a need for instruction. A study of the various departments in like manner will reveal the shortage in numbers of workers and the degree of efficiency of workers already on the job. Wherever the need occurs, whether in the card room, the spinning room, or the weave room, it can be remedied in part by the right kind of instruction.

Not only should the investigation show the nature of the instruction needed, but at the same time it should determine the type of school or classes by means of which the instruction can be imparted. By this is meant, whether an evening school or a part-time school will be conducted. This will depend largely upon the organization of the mills and the attitude of the mill officials. If the organization of the mills and the willingness of the mill officials permit of employees taking a part of their working hours for instruction the solution of the problem is a part-time school. If, however, workers can attend classes only after working hours it will be necessary to organize evening schools. These two types will be discussed later in this report.

(3) *Appointment of directing official.*—It is quite necessary that so important an undertaking have some one in charge to look after its organization, its operation, and its development. It is necessary that records be kept, reports made, and its results determined. It is therefore not enough that experts meet classes in isolated groups for purposes of instruction; a directing official should be appointed whose duties consist of properly directing and accounting for the project. The local superintendent of schools may wish to be personally responsible for these duties, inasmuch as the scheme will most likely be considered a part of the regular school system. He may detail one of his school principals or other school or mill officials for the work. While it is absolutely necessary for the teachers to be expert mill operatives, it is not so essential that the directing official be thus equipped. The latter is quite desirable, however, as he would then be prepared to pass upon the efficiency of the instruction and assist the individual teachers in improving his methods of presentation. In many mills are to be found textile graduates who would make excellent directors for the evening or part-time schools. In small schools one of the instructors may be appointed chairman

of the group and held responsible for records and reports to the local board, which in turn reports to the State board.

The cotton-mill officials, with their complete organizations in the industry, comprising superintendents, overseers, second hands, section hands, fixers, and operatives, each with a definite job for which he is held responsible, will at once realize the necessity of having some one responsible for the organization and conduct of the evening or part-time textile school. Unfortunately such a director can not be paid from Federal funds as the law permits of reimbursing for salaries of teachers only, thus making no provision for supervision in local schools. The benefits to be derived, however, will more than repay the local and State authorities for the small financial outlay.

(C) TEACHERS.

The success of special textile schools or classes depends more largely upon the teachers than any other factor. The consideration of most importance is, therefore, making provisions for the right kind of teachers. If the institution is to function as a vocational enterprise, teachers with adequate trade or mill training are absolutely essential.

(1) *Source of teachers.*—The erroneous idea prevails in some localities that teachers can be had only from special textile schools. It may be desirable for some forms of instruction to have teachers trained at institutions of this kind, but for the greater part of the vocational instruction the overseer, second hand, or operative direct from the mill, who is in daily contact with actual productive operations, is the best qualified to do the teaching. Therefore, the source of supply for teachers will be found in the mills of any community having large numbers of textile workers. For vocational instruction the practical and experienced mill man is to be preferred to the graduate of the textile college, unless the latter has in addition to his collegiate training long years of experience in the mill also. Emphasis is placed on the fact that it is vocational, not theoretical, instruction that is sought. *In brief the teachers for these classes are to be found in the mills.*

In practically all of the schools and classes set up in connection with this experiment and report the teaching force was made up of overseers and other workers in the mills. The one conclusion reached that stands out above all others is that *no other kind of teachers are needed.*

(2) *Qualifications of teachers.*—The teacher of the classes under consideration should be able to express himself readily; he should have a good personality. He should be presentable in person, consistent with the work in hand. He should have all the qualities to be found and desired in teachers along other lines, but the most essential qualification, and without which he will fail, is that he should know his job. If it is weaving that is to be taught, the best

weaver in the mill should be sought for teaching purposes; if the subject under consideration is loom fixing, the most expert loom fixer should become the instructor, and similarly throughout the mill. A vocational teacher should be able to skillfully perform the tasks found in his vocation.

(3) *Training teachers for service.*—The Federal act makes provisions for training teachers in vocational subjects, and a special fund takes care of this problem. Each of the States comprising the southern cotton-manufacturing group has provided for this service in its State plan. By these plans, already put into operation in some States, certain educational institutions or boards are charged with the responsibility of preparing teachers for vocational work. The plans permit of the institutions sending their professional men to the industrial centers and there give training in the art of teaching to skilled workers who expect to be recruited as teachers of vocational subjects. The teacher-trainer may thus go into the mills and assist skilled operatives in properly organizing their trade knowledge for teaching purposes. This was done to excellent advantage in the several classes organized as a basis for this report. Many of the States are also providing State supervisors who assist towns and cities in the organization of vocational classes. Both of these forms of service are without expense to the local educational boards.

(D) EQUIPMENT.

(1) *Nature of equipment.*—The nature of the equipment to be used in textile classes will necessarily depend upon the nature of the instruction contemplated. If the instruction is in the form of actually operating machines, or a study of their construction, adjustment, and repair, it is evident that equipment similar to that of the mill must be made available. Much can be done in some phases of the work by use of charts, diagrams, and commercial catalogs, especially if the nature of the course is that of related work rather than the strictly operative phase. Even for the courses tending toward mathematics and applied mechanics, such as card-room calculations, etc., it is advisable to make use of the actual machines for demonstrations. Whether classes are held in school buildings, under the mill roof, or elsewhere, comfortable chairs and tables, blackboards, and good lighting should be provided. It could not be expected that interest would remain long on the part of the mill operative if he should be expected to take his notes over a bale of cotton or make his calculations against the side of rough mill wall. If the project is worth while, it is worth making some suitable provisions for carrying it out under favorable conditions. If the school and mill authorities and the teachers show that time, thought, and effort have been spent in daily making preparations for the work, the

mill operatives for whom the instruction is intended will in turn be more inclined to respect the undertaking and profit by it.

(2) *Use of the mill equipment.*—In many of the classes organized under the supervision of this survey, the pupils met in the mills and the instructors and pupils made use of the machines and equipment in daily operation. Such use of mills for instruction purposes is highly recommended, and has the additional advantage of surrounding the class with commercial and productive problems. It also increases the tendency to keep the class work vocational in its nature. It makes possible the use of the proper kind of equipment without additional expense.

(3) *Demonstration machines.*—If in extreme cases it is not practicable nor does not seem advisable for the instruction to be given under the mill roof, demonstration machines and equipment should be provided. This equipment should be as nearly the same type and placed as nearly under the same conditions found in the mill as the circumstances will permit. For this purpose additional equipment may be procured or that from the mills installed in the school shop.

(C) RECORDS, FORMS, AND REPORTS FOR TEXTILE CLASSES.

If the school is to be put on a permanent and substantial basis, it is just as essential that proper records be kept as in the case of regular academic schools. These records are necessary for future use as well as for the accounting to the State boards during the current sessions. The following forms represent the minimum with which a school should attempt to operate. Well-organized schools in which various lines of work are attempted will find need for other record forms.

(1) *Application.*—A textile school or class operating under the Vocational Education Law does so through the State board. Local authorities, therefore, asking aid from State or Federal sources are expected to make formal application to the State boards. In this application should be set up the plan contemplated, including (a) the type of school, (b) courses of instruction, (c) names, qualifications, and salaries of teachers, (d) length of term, (e) nature of equipment, and (f) amount of funds for which application is being made. The amount of money asked for will depend upon the plans of each State board. The plans of apportioning vary in the several States, some of which are as follows:

(a) Federal funds one-half, State funds one-fourth, local funds one-fourth.

(b) Federal funds one-half, local funds one-half.

(c) Federal funds one-half, State funds one-half.

For the purpose of making application to the State board the following form is suggested:

APPLICATION FOR STATE AND FEDERAL AID.

City.....State.....
Date.....19.....
To the State Board for Vocational Education,
City....., State.....

The board of education of hereby makes application for aid under the terms of the Vocational Education Law for conducting vocational classes in connection with the textile industry.

Type: (1) Evening textile school..... (2) Part-time textile school.....
(3) Part-time general continuation school.....

Subjects taught.	Name of teacher.	Num-ber of pupils.	Salary for voca-tional classes.	Length of course.		Funds.		
				Num-ber of hours per week.	Num-ber of weeks per year.	Fed-eral.	State.	Local.
Total.....								

TEACHERS.

Name.	Subjects taught.	General education.	Special or technical education.	Teaching experience, in years.	Textile mill experience, in years.

Outline of course of study:
NOTE.—If courses outlined in this bulletin are followed reference to same by name and number is sufficient.

Equipment:
(List here the equipment available.)

Location of school:
(1) School building..... (2) Mill..... (3) Elsewhere.....

Names of cotton mills participating:
.....
.....
.....

The school agrees to conform to these terms:
The instruction is under public supervision and control; it is less than college grade; the minimum age of pupils enrolled is 14 years for part-time or 16 years for evening classes; the Federal moneys will be used only as reimbursement for part payment of teachers' salaries; the controlling purpose is to fit for useful employment; Federal money will be matched in its expenditures for salaries by State or local money; funds for supplies, equipment, and maintenance are not to be taken from Federal mon-ey; for part-time classes the pupils will have entered upon employment; for evening classes the in-struction supplements the daily employment of pupils.

In accordance with the above conditions the undersigned hereby makes application to the State board for \$....., for the period beginning (date)..... and ending (date).....
(Signed).....
(Title).....
For Board of Education of

(2) *Enrollment.*—Some form of enrollment blank giving data as to educational preparation, employment, etc., should be provided. The following is offered as a suggestion:

ENROLLMENT CARD.

No..... Date.....

Name..... Age.....

Address..... Telephone No.....

Employed at..... Mill.

Present job..... In..... Room.

How long have you been at present job?.....

How long on last job?.....

Name of overseer.....

School last attended.....

Finished first grade.....; second.....; third.....; fourth.....

fifth.....; sixth.....; seventh.....; years in high school.....

Parent's name.....

Number in family..... Number in family employed in mill.....

Course desired.....

School or mill.....

(3) *Class record.*—The instructor should be provided with a class record book, or card, on which the attendance, class proficiency, etc., may be recorded each day, or evening, the class recites. The names are transcribed from the enrollment cards to this class record after the organization is effected. The following simple form will suffice:

CLASS RECORD.

Course..... Textile Unit No.....

Date organized..... Date closed.....

School or mill.....

Instructor.....

Pupils' names.	Enrolled card No.	Lesson No. ¹						Grade.	Remarks.
		1	2	3	4	5	6		

¹ The number of columns should correspond with the number of lessons in the course.

NOTE.—Symbols for grading: E—Excellent. A—Average. L—Low. F—Failed.

One of these forms is used for each class and each unit course, after the completion of which the final result of each pupil's work should be transferred to a permanent school record.

(4) *Permanent record.*—A permanent summary of each pupil's work should be preserved. This record book, or card, should provide for recording the results of each unit course as completed by the pupil from time to time. As the transfer is made from the class record at the completion of each unit course the permanent record serves as a means of bringing together the pupils' final grades in the form of a summary on one page, or card.

The form below represents a simple method of recording the information desired for a permanent record:

PERMANENT RECORD.					
Name of pupil.....					
Address.....			Date of first enrollment.....		
Mill in which employed.....					
Name of course.	Textile unit number.	Date completed.	Instructor.	Grade.	Remarks.
.....
.....
.....
.....
.....

(5) *Certificate of completion.*—Much encouragement will be given pupils for their efforts if provision is made for supplying them with some form of formal recognition on completion of each unit course. Such can be done in the form of a properly printed certificate. The forms commonly used in other educational activities may be used in this connection. Further encouragement to continued effort may be secured by issuing a diploma to the holders of a definite number of certificates. The omission here of a sample certificate is not to be interpreted as minimizing the importance of providing the pupils with such documents. The universal use of such forms renders an illustration unnecessary.

(6) *Requisition for State and Federal funds.*—The State boards are expected to account for moneys expended in due legal form. A proper accounting on the part of the local boards and presentation of the same by approved methods will greatly assist the State boards in performing the duties connected with reimbursing schools from Federal funds. Forms for making requisition for reimbursement of teachers' salaries may in some cases be had from the State office. In the absence of these, some such form as the following is suggested:

REQUISITION FOR REIMBURSEMENT.

Place..... Date.....

To the State Board for Vocational Education,
City..... State.....

GENTLEMEN: The Board of education of.....hereby makes requisition for a warrant to be drawn in favor of the.....public schools in the amount of \$.....

This sum is requested as reimbursement for part payment of salaries of teachers named below in accordance with application of (date).....and agreements subsequent thereto.

The period of service covered by this requisition is from (date).....to (date).....inclusive.

Teacher.	Subject.	School.	Number of days or evenings taught.	Salary per day or evening.	Total vocational salary for inclusive dates.	Amount requisitioned.	
						State.	Federal.
Total.....					\$.....	\$.....	\$.....

I hereby certify that the above named teachers have devoted the specified time to teaching vocational textile classes and that the undersigned board is entitled to reimbursement for moneys paid for such service.

(Signed)
(Title)
For Board of Education of.....

Subscribed and sworn to before me this..... day of....., 19....
(Signed)
Notary Public.

NOTE.—The State boards usually make reimbursement quarterly, semiannually, or annually.

PART II.

POSSIBLE TYPES OF INSTRUCTION UNDER THE FEDERAL VOCATIONAL EDUCATION LAW.

Part II.—POSSIBLE TYPES OF INSTRUCTION UNDER THE FEDERAL VOCATIONAL EDUCATION LAW.

1. EVENING SCHOOLS.

As previously indicated in this report the greatest possibilities in the use of the trade and industrial funds under the Vocational Education Law lie in the evening schools. This is especially true when applied to the textile industry in the Southern States. It is possible under the terms of the vocational act for two-thirds of the trade and industrial funds of any State to be used in evening schools or classes. In the order of importance from the standpoint of possibilities and adaptation to industrial conditions the evening school ranks first, and secondly the part-time school. Little or no consideration need be given to the organization of the so-called all day school in cotton mill communities of the South at the present time.

(A) PROVISIONS OF STATE PLAN.

(1) *Age requirements.*—The minimum age for pupils in the various State plans is 16 years. There is no upper limit with reference to age. In the classes thus far organized in compliance with the recommendations of this report the average age is about 32. As evening classes are intended for those who have entered employment, and by experience have found that they are deficient, it is only reasonable to assume that the classes will be made up of men or women of some maturity. It is to be borne in mind that the age of 16 as specified in the State plans is a minimum and should not be interpreted as a recommendation. In fact, the average age of evening classes will be much higher if the instruction is organized to properly function in the needs of industry.

(2) *Daily employment.*—The State plans, in keeping with a requirement of the vocational act, specify that the instruction in evening classes shall supplement the daily employment of the persons making up the classes. By this is meant that the instruction must be of a trade nature, dealing with the manipulative side of the trade, as the study and operation of a loom, or with subject matter directly related to some phase of the industry, the science or mathematics or drawing of the trade as, for example, the science of dyeing and bleaching, card room calculations or textile design. The pupil must be engaged in the work of the industry to participate in evening schools or classes designed for that industry. Thus store clerks, messenger boys and regular pupils of the common schools not engaged in

cotton mills, would not be eligible for enrollment in the evening textile class. The restrictions, however, do not hold within the industry of limiting card room operatives to courses relating to carding, spinners to spinning room courses, etc. On the other hand, employees of one department within the industry may, and should be encouraged to, take courses designed for another department. A spinner or doffer may thus have opened to him the advantages of the weave room or other departments within the mill.

(3) *Nature of instruction.*—It will be seen, therefore, that such instruction as general reading, arithmetic and other subjects of the common school curriculum will not be subject to Federal aid in evening classes. It is hoped that the local communities will make such provisions for general evening classes as will enable the fundamentals of arithmetic and English to be taught to those whose educational preparation will not permit them to profitably enter the evening vocational classes. In the investigation incident to this report it was found to be universally true that the Southern cotton mill workers in large numbers lacked sufficient training to enable them to intelligently deal with the simple calculations connected with their daily work.

Several of the States have funds appropriated for adult schools in the removal of illiteracy and for general evening schools. This and other devices should be utilized in the establishment of general classes in connection with the vocational classes. In such cases the latter may be partly supported from Federal funds, the former from State or local funds. With a scheme of cooperation such as just mentioned in which both vocational and general instruction is given, the vocational classes could look to the general classes for their source of supply. The fundamentals of arithmetic, so much needed in all cotton mill operations can, however, in the hands of the right teacher, be taught from problems met with in the mills. Thus an arithmetic class, made up of cotton mill workers, the problems and calculations of which are drawn entirely from the operations encountered in the mill, may be considered as coming under the provisions of the various State plans for evening vocational classes. Such a course of instruction is referred to as textile unit No. 15 in the list of short unit courses indicated below under courses of study, and more fully outlined in Part III of this report.

(B) ORGANIZATION OF EVENING SCHOOLS.

The evening vocational school or class may be defined as one which offers instruction to persons over 16 years of age supplementing the daily employment and at a time outside of their regular working hours. The basis of distinction between part-time and evening

schools is a relation of the worker to his time of employment rather than to the time of day or night. A part-time class is held during working hours, and evening class outside of working hours. Evening schools are usually held in the evening, but for a night shift of employees an evening class may be held during the day. Workers due to report to the mill at 10 o'clock in the forenoon may report to an "evening" class at 8 or 9 o'clock the same morning.

What has been said previously relative to the administration and organization generally under the Vocational Education Law (Pt. I, 3) applies especially to evening schools. In discussing the topics regarding the cooperative boards, the procedure to be followed by local communities, teachers, equipment and records, the evening school and its organization was constantly kept in mind.

There is no limit or restrictions as to the length of an evening school or class. It may continue for a few evenings, weeks, months, or years. It may be simple or pretentious in the number of participating groups. These groups may be represented by the following:

(1) *The single isolated class*, in which one teacher meets a group of interested employees for instruction.

(2) *The evening school of many classes*, consisting of several teachers under the same roof dealing with different phases of the work to be found in the mill, with or without a directing principal.

(3) *Evening centers under one organization*, as for example, when a single board establishes classes at the various mills or mill centers of a community for the convenience of workers widely separated. This is especially desirable when the distances between the various mills of a city are unusually great. In South Carolina, North Carolina, Alabama, and Georgia are to be found examples of each of these types in operation in connection with this survey and report.

(C) COURSES OF STUDY.

(1) *Short unit course plan*.—It is generally agreed that for evening schools the most successful methods are through what is known as the short-unit course plan. The evening school under the old plan of conducting long continuous courses of a general nature extending through seven or eight months without a break has been a failure in all sections of the country. Enthusiasm is high and enrollment heavy in the beginning, but the classes gradually lose their membership and usually die out before the expiration of the allotted time. It is too much to expect men and boys to come night after night for instruction which does not bear directly on their problems of the day and does not aid them in overcoming the difficulties which retard their promotion. If the evening school expects to hold the interest of persons after a hard day's work in the mill it must offer instruc-

tion which in short periods drives directly to the point. General instruction will not suffice; it must be specific.

The short-unit course meets these conditions. It is an intensified form of instruction. Each unit deals with one particular phase of a trade and is somewhat complete in itself. The unit is designed to meet the needs of a particular group of operatives in a given number of lessons. The average operative of the weave room might agree to attend 12 nights comprising a course in loom-fixing, but would balk at the idea of attending all winter a general textile course. The units therefore should be short as well as direct. This report attempts to name some of the short units which could be offered to advantage in the textile industry through the medium of the evening school.

(2) *Proposed units for southern cotton mills.*—The following list is offered as a suggestion for the treatment of some of the phases of the textile industry in short-unit courses. Emphasis is placed on the fact that the list does not represent a continuous course of study, and that it is not expected that any one community will treat it in its entirety. Like a bill of fare it is offered for the purpose of selecting what is needed. This selection will depend upon the actual needs of the particular community. In all probability three or four of these units will represent the total for any locality during the year. A few units for which careful preparation is made and given in an effective way will result in more good than many of them attempted in a careless and indifferent fashion.

The number of lessons in the following list is approximate and should be varied to suit local needs. Brief outlines of these units, for suggestions to instructors are found in Part III of this report.

Summary of unit courses of study for vocational textile classes.

[The number of lessons is approximate and may be varied in different localities.]

TEXTILE UNITS.

	LESSONS.
1. Progressive survey of processes showing the relationship between steps in manufacturing product.....	10
2. Cotton sampling and grading.....	10
3. Opening and picking.....	8
4. Carding.....	12
5. Combing.....	16
6. Drawing frames.....	5
7. Roving frames.....	10
8. Spinning frames.....	8
9. Spooling.....	3
10. Warping.....	3
11. Slashing.....	5
12. Reeling.....	3
13. Winding.....	3
14. Twisting.....	6
15. Cotton mill arithmetic.....	48

16. Card room calculations.....	10
17. Spinning room calculations.....	8
18. Weave room calculations.....	12
19. Mule spinning.....	24
20. Elementary designing and cloth analysis.....	24
21. Plain weaving.....	6
22. Plain loom fixing.....	14
23. Inspection of the woven cloth.....	3
24. Cotton mill machinery, organizations for various classes of goods.....	5
25. Cotton mill records and reports.....	4
26. Cost finding in cotton mills.....	48
27. Fancy cotton cloth analysis and designing.....	24
28. Fancy weaving and fancy loom fixing.....	12
29. Jacquard cloth analysis and designing.....	24
30. Jacquard weaving and Jacquard loom fixing.....	12
31. Power and its application to textile machinery.....	10
32. Textile chemistry and dyeing.....	24
33. Bleaching and finishing yarn and cloth.....	24
34. Humidity in the cotton mill.....	3

NOTE.—For fuller outlines of individual units see Part III. Other units should be added according to actual local needs for individual mills.

(3) *Units grouped by occupations.*—Units should be grouped in such a way that a progressive sequence can be maintained for operatives of any given department. As each unit is completed it should be followed by a unit of the same workroom. In this way groups can be maintained for card room, spinning room, and weave room operatives simultaneously, and a logical sequence also maintained within the group. Such grouping will vary in different communities, and for different years, depending upon the actual needs for the individual units. In the analyses outlined in Part IV (3 and 4), will be found recommendations as to courses usually needed by the workers of the several departments. Operatives should be privileged, however, to select units from other departments than the one in which they are employed. There should be considerable freedom in this selection, limited only by the ability of the pupil to pursue the course. A separate grouping should be made for overseers, second hands and section men, even though some of the course offered for operatives are duplicated. It is presumed that these advanced workers are in a position to pursue the courses more rapidly and from a different viewpoint, and if grouped with the average operatives will be either retarded by them or advance these operatives to their detriment from the standpoint of thoroughness.

2. PART-TIME SCHOOLS OR CLASSES.

In framing the Federal vocational act Congress placed special emphasis on the part-time school by making it a requirement that at least one-third of the trade and industrial funds be spent on this

type of instruction. The whole of the fund in any State may, at the discretion of the State board, be thus used.

The part-time school gets its name from the fact that the pupils in attendance are employees and spend a *part of their time* for the purpose of receiving instruction. As indicated in the discussion on evening schools, part-time pupils receive instruction in organized classes *during* regular working hours, and evening school pupils attend classes *outside* of working hours. The several types of instruction and types of organization will be discussed below.

(A) TERMS OF STATE AND FEDERAL PLANS.

The State and Federal plans call for the observance of the following terms in the operation of part-time schools:

(1) The school is administered under public supervision and control.

(2) The controlling purpose is to fit employees for further useful employment.

(3) The instruction is less than college grade.

(4) The minimum age of pupils is 14 years (no upper limit is specified).

(5) Federal funds are duplicated from sources within the State. Thus, the Federal Government may furnish one-half of the money, the State or local governments, either separately or in combination, furnishing the other half.

(6) The only use for which Federal funds are drawn is that of paying teachers' salaries. Equipment, supplies, and other forms of maintenance are provided aside from Federal sources.

(7) The pupils have entered upon employment, the time of instruction coming from their regular hours of work.

(8) The school is organized on the basis of a minimum length of term of 144 hours of instruction during the year.

(B) TYPES OF INSTRUCTION.

There are many kinds of instruction possible in part-time schools or classes. The act itself is very broad, and the Federal Board in its policies has rendered the application in this respect very flexible. When one has entered upon employment—a necessary condition for part-time instruction—he is no longer participating in the scheme for general education as regularly provided for by the State. In other words, when he has quit the regular school he no longer directly benefits by it. A scheme which will permit him to continue either his academic or trade education after discontinuing the general school and while still at work is therefore not a duplication of that school. The type of school which will accomplish this for the

industrial worker is therefore recognized as a part-time school by the Federal and State boards, and as such is subject to Federal subsidy.

While there are many applications in the broad interpretation of the act, all may be comprised within the three general types of instruction which follow:

(1) *Trade extension part-time classes*.—This type of instruction deals with the subject matter of the same trade in which the pupil is employed. It extends his trade or occupational knowledge. Under this type of school a person employed in a cotton mill would take instruction which would increase his knowledge necessary for promotion in the cotton mill. A weaver entering a class in loom fixing or a spinner in a weaving class are representatives of this type.

(2) *Trade preparatory part-time classes*.—This kind of school attempts to introduce an employee in one trade to a new trade. As the name implies, it prepares for a new occupation or industrial pursuit. An illustration of this type would be that of a store clerk or delivery boy entering a textile class.

(3) *General continuation part-time classes*.—The act makes provisions for the teaching in part-time schools of "any subject given to enlarge the civic or vocational intelligence" of workers. When such instruction is designed to increase the civic intelligence it is classed as general continuation part time. As is indicated by the name, it continues his general education.

On account of the tendency of children in the cotton-mill communities to discontinue school at an early age and seek employment, thus depriving themselves of a general education, the Federal Board wishes to place special emphasis on the general continuation part-time school. The subject, therefore, will be discussed in full in Part V of this bulletin, where courses of study, methods of organization, etc., are proposed. As it is not the aim of the vocational act to aid the States in their general schemes of academic education, it is obvious that general continuation part-time classes under the act will have to be conducted with segregated groups of pupils organized for the special purpose. There will consequently be no mixing of part-time pupils in the same classes with those of the general school.

(C) TYPES OF ORGANIZATION.

As has been previously stated, part-time instruction is that which takes place during the regular working hours of employment. This does not mean that the only plan applicable is that of actually coming off the job during the day. In fact, of the four types mentioned below only one, the "off-time" plan, depends upon this arrangement for its execution. The dull season or shut-down plan, the alternate plan, and the preemployment or vestibule school, all have provisions

for carrying on part-time instruction without interfering with the daily schedule of the mill.

(1) *Preemployment or vestibule school*.—This type of school provides for inducting new employees into the mill by grouping them together under the mill roof for instruction on how to operate the machines before actually beginning regular employment. For example an expert weaver, acting as the instructor, may take a group of prospective workers in charge and prepare them for entering the weave room on a productive basis. The scheme of instruction will in most cases extend beyond the vestibule period as the total time of instruction must be at least 144 hours, the minimum under the Federal act. A recent ruling on the part of the Federal Board is that persons under contract for employment may be considered as employed in the application of part-time instruction. This ruling, therefore, brings the vestibule school under the provisions of the law in part-time education.

The Rosemary Manufacturing Co. of Roanoke Rapids, N. C., in cooperation with the experiments in connection with this survey, has had the vestibule scheme in operation for several months. Two teachers for each of the three weave rooms, and one teacher each for the three spinning rooms, making nine in all, were put on this work. The teachers were selected from the best operatives in the mill, released from production and assigned the duties of teaching. Mr. John L. Patterson, manager of the mill, after trying the scheme for two months, writes: "These teachers devote their time to showing the new operatives assigned to them how to do the work properly. We of course pay the teachers as much, in fact slightly more, for doing this work than they were able to make before. The results we are getting from this system are very gratifying and we confidently believe that satisfactory operatives can be developed in this way within half of the time, or possibly one-third of the time, that they can be if placed with weavers or spinners with a full job on their hands, and no special incentive to properly teach the inexperienced ones."

It is essential that such a school be under public control and otherwise comply with the terms of the vocational act if reimbursement from Federal funds is expected.

(2) *The alternate plan*.—This plan has been much used in industrial education of late years. It consists of dividing the group of pupils into two parts, one half of which work in the mill while the other half attend school. They exchange places periodically and thus alternate work and school. This alternation may take place in a number of ways, as for example:

(a) *By half-day*, in which the pupils work and attend school a half-day each (in operation at New Holland, Ga., in this survey).

(b) *By day*, in which the period of alternation is a day at a time.

(c) *By week*, giving the pupils a longer period before exchanging places (in successful operation at Spartanburg, S. C.).

(3) *Dull season, or shut down plan*.—In many instances mills are found to be shut down for a short period of time from various causes, such as lack of water power in dry season, overstock of manufactured product, etc. Such time can be used to good advantage in part-time education. A school for employees under such conditions may run four hours a day for 36 days, six hours daily for 24 days, eight hours daily for 18 days, etc. In each case the minimum of 144 hours is provided for in these short courses.

(4) *Off-time plan*.—In extreme cases conditions may be such that workers in small numbers may actually take time from the working hours for purposes of instruction. This seems to be unusual in the textile industry, but similar cases have been noted in southern cotton mills. It is not practicable to leave the machines without attendants. The following methods are used for releasing a part of the mill force while at classes.

(a) *Spare hands*.—In normal times every mill has a corps of extra or spare hands to substitute for absentees, etc. The spare hands may likewise release others for part-time classes.

(b) *Flying squadron*.—This is a type of spare hands but instead of substituting for a day or half-day for absent employees the members of this crew go about the operation rooms relieving workers for an hour or so at the time. This may be applied for instruction, as well as for rest, sickness, and recreation.

(c) *"Doubling-up"*.—A number of operatives may "double-up" or take on additional machines for awhile for the purpose of excusing others for part-time classes.

(d) *Surplus machinery*.—Ordinarily in a complete mill each room or department has just enough machines to supply the next higher process with material. In the event of one department having more machines than is necessary to keep the next higher in operation, it could by running full force pile up a surplus of stock and thus enable its operatives to have time for attendance upon part-time classes. The Unity Cotton Mills at Lagrange, Ga., is thus equipped with surplus machines.

(D) COURSES OF STUDY.

In Part V of this report will be found a proposed course of study for general continuation part-time work. This scheme assumes that several common school subjects, adapted to the environment of the mill village, will be pursued. The time could be concentrated on one or two subjects and still come within the provisions of the State plans. Whether many or few topics will be given to constitute the 144 hours minimum requirement, is a matter of local concern.

For trade extension, or trade preparatory part-time courses the short unit courses outlined in Part III are applicable when a satisfactory grouping is effected.

Trade extension, trade preparatory and general continuation part-time courses may be applied as to organization in the alternate, shut down, or off-time plans. The vestibule or preemployment plan is limited to trade preparatory instruction.

(1) *Adaptation of unit courses to part-time instruction.*—Inasmuch as pupils will have entered upon employment and have only a part of their day or week for purposes of instruction, it is obvious that they will want to conserve time and, as in the case of evening schools, will demand courses which are direct and deal with subject matter in specific form. The short-unit plan serves well the purposes of part-time work in this respect. In arranging part-time schedules a group of related short units arranged in logical sequence constitutes the best plan. Topics or short units not so directly related may be arranged in parallel to make up the total of 144 hours. It should be understood that 144 hours constitutes the minimum under the law and should not necessarily be taken as a recommendation.

(2) *Unit courses grouped for part-time classes.*—This grouping will depend upon the needs of the particular class and the interest of the individual members. The grouping for a class of card-room operatives might consist of the following short-unit courses listed on page 28 of this report: Cotton-mill arithmetic, followed by card-room calculations, paralleled with carding, combing, and drawing frames. Such a combination might easily consume 144 hours of recitation. For weavers this combination is suggested: Cotton-mill arithmetic and weave-room calculation arranged in sequence; elementary design and cloth analysis, plain weaving, plain loom fixing, arranged in parallel. These groupings are given here merely as suggestions and to illustrate the point. In all probability no two communities would have similar needs to justify the same grouping.

3. UNIT TRADE DAY SCHOOL.

The unit trade day school prepares young men and women for a definite occupation or trade. It is for those who have not yet entered upon employment, but who are preparing for it. The unit trade day school should not be confused with manual training and workshops connected with the regular high schools. The latter do not attempt to fit for a particular trade. The aim is merely to add to the all-round training of pupils in their general education. In other words, these belong to general education. On the other hand, the unit trade day school does not deal with general education, but enters the field of special education. What general education is

needed for successful entrance upon the particular trade should be made a prerequisite for entrance into the trade school. This will vary for the several trades to be found in industry. With this prerequisite satisfied, the trade school can proceed directly with its specific work of giving trade instruction.

The unit trade day school in the textile industry would deal with the cotton manufacturing trade in its various phases, and its aim would be to fit pupils for successful entry upon the work of the mill.

(A) REASONS WHY NO DAY-SCHOOL EXPERIMENTS HAVE BEEN TRIED
IN THIS STUDY.

(1) *Longer time and more detailed study required.*—The purpose of this survey was to ascertain how the Vocational Education Law could be most advantageously applied to the textile industry. It aimed, also, to get plans and methods of procedure into the hands of school and mill officials at the earliest possible date in order that the States might immediately make use of the funds that would revert to the Federal Treasury at the end of each fiscal year if not expended in the meantime. The day-school proposition is one that requires much time and detailed study, as well as the expenditure of vast sums of money for plant, equipment, supplies, and maintenance. War conditions and building restrictions have been such that local communities would not have been justified in considering the establishment of a unit trade day school at this time even if such had been contemplated. The Federal Board, therefore, has had no medium for experimentation along this line because no community has offered the opportunity.

The evening and part-time schools, on the other hand, require no great expenditures of money, and they are known to be practicable in this as well as other industrial pursuits.

It is the opinion of the Federal Board at this time that the unit trade day school in textiles is of doubtful value in the South at present. The textile centers are not large enough to successfully operate such schools, and the per capita cost would be almost prohibitive if successfully maintained.

(2) *No experience upon which to build.*—Experiments in the day school in this study would have necessitated taking data from existing schools. The South has no textile schools of this type of less than college grade. It was not considered advisable to recommend the textile schools of the Northern States as models for the South without more detailed study and investigations than was possible without delaying the proposed programs for the evening and part-time schools.

(B) POSSIBILITIES OF DAY SCHOOLS SHOULD BE INVESTIGATED.

(1) *Supply of pupils.*—In considering the establishment of a day school in textile education due consideration should be given to the probable supply of pupils. The unit trade day school in any industry, it is to be remembered, enrolls only those pupils who have definitely decided to enter that industry for a livelihood. The prevocational or "trying-out" period for the purpose of ascertaining if such employment is desirable does not come within the scope of the day school under the Vocational Education Law. The subject of the supply of pupils, therefore, demands serious consideration and careful study on the part of local communities before going to the enormous expense incident to the establishment of day schools of the unit trade type.

(2) *Advantageous employment.*—One of the tests of a successful trade school is whether the pupils completing the courses actually enter the industry for which instruction was given and upon such entrance whether the industry recognizes such previous preparation and provides advantageous employment. If no particular advantage is to be given those completing such instruction it is obvious that the industry recognizes no special value in it. A study equally important as the supply of pupils is, therefore, that of what will become of the pupils after completion of the courses offered. Due consideration of advantageous employment in the industry needs to be given in connection with a survey as to the advisability of establishing a day school.

(3) *Cost of plant, equipment, and operation.*—The cost of building and equipping trade schools and that of maintenance should be thoroughly investigated. As compared with the traditional academic school the expense of teachers and supplies is usually large. If supplies are limited trade instruction on a productive basis will be handicapped. The teachers must be specialists, equipped by technical schooling and, above all, practical experience. Such teachers are in a position to command high salaries.

Authorities on vocational education are universally agreed that it is dangerous to assume that a school plant can be made into a revenue producer. Production will scarcely more than pay for supplies. It is to be remembered that the school is for instruction purposes and not for production. Investigations show that where schools have reached the profit stage, instruction is being sacrificed for the sake of production.

The Federal Board, in the light of its experience and investigations, cautions against the assumption that the expense of maintenance of a day school can be materially reduced through the production and sale of the manufactured product constituting the shop-work of the course.

(C) CONDITIONS UNDER WHICH DAY SCHOOLS MAY BE ORGANIZED UNDER THE TERMS OF THE VOCATIONAL EDUCATION ACT.

In addition to the conditions set up under Part I, 3, with reference to public control, controlling purpose, college grade, minimum age, use and matching of Federal funds, the following terms are essential under the vocational act.

(1) *Length of term.*—The day school must be at least nine months in length per year, with a minimum of 30 hours of instruction per week.

(2) *Shop or operative work.*—Of the 30 hours minimum, not less than 15 must be spent in the operation of machines on a useful and productive basis. Whatever may be the time of instruction, one-half must be devoted to the manipulative side of millwork.

(3) *Theory work.*—The half-time shopwork indicated above must be backed up by the theory side of the trade to the extent of 30 to 35 per cent of the pupils' time. The minimum division of time for the whole course is therefore,

	Per cent.
Shopwork.....	50
Related or theory subjects.....	30-35
Nonvocational subjects.....	15-20

(D) ASSISTANCE OF FEDERAL AND STATE BOARDS FOR SPECIAL PROBLEMS.

Only a few, if any, communities of the South will consider the establishment of a day textile school. The Federal Board does not, therefore, consider further discussion necessary here. Individual surveys will of necessity have to be made in each case. The State and Federal Boards will render such assistance and cooperation as may be desired by these local communities which have such a project in contemplation.

4. ILLUSTRATIONS OF TYPES BY EXISTING SCHOOLS.

During the past few months over which this study was conducted the Federal Board in cooperation with the State boards of several States succeeded in putting into operation a few of the types of schools proposed in this report. These schools used for the most part the recommended courses of study, or short unit courses, outlined in Part III of this bulletin.

As a result of evening instruction covering only two months' time reports from the overseers of some of the mills state that there is a decided decrease in the number of "seconds" produced by their mills. This is very significant inasmuch as the conclusions reached were based, not upon mere estimate, but upon actual records kept during each month.

Existing schools and classes.

Name of course.	Type of organization.	Number of classes.	Textile unit No.	Teacher.	Mill.	City.
1. Designing and cloth analysis, and weave-room calculations.	Evening..	1	18, 20	Overseer.....	Brogan Mill.....	Anderson, S. C.
2. Carding and card-room calculations.	...do.....	1	4, 16	Assistant to superintendent.	...do.....	Do.
3. Spinning and spinning-room calculations.	...do.....	1	8, 17	Secondhand.....	Ware Shoals Manufacturing Co.	Ware Shoals, S. C.
4. Weaving and weave-room calculations.	...do.....	1	21, 18	...do.....	...do.....	Do.
5. Carding and card-room calculations.	...do.....	1	4, 16	Overseer.....	...do.....	Do.
6. Advanced mill calculations.	...do.....	¹ 1	16, 17, 18, 24	Assistant superintendent.	...do.....	Do.
7. General continuation.	Part-time, alternating one-half day.	1	.....	Teacher.....	Pacolet Manufacturing Co.	New Holland, Ga.
8. Mill machine shop.	Evening..	1	.....	Foreman.....	...do.....	Do.
9. Carding and card-room calculations.	...do.....	1	4, 16	Overseer.....	...do.....	Do.
10. Spinning and spinning-room calculations.	...do.....	1	8, 17	...do.....	...do.....	Do.
11. Weaving and calculations.	...do.....	1	18, 21	...do.....	...do.....	Do.
12. Mill interests and industrial conditions.	...do.....	1	.....	Research worker.	...do.....	Do.
13. Carding and card-room calculations.	...do.....	1	4, 16	Overseer.....	Pelzer Manufacturing Co.	Pelzer, S. C.
14. Warping, weaving, and weave-room calculations.	...do.....	1	10, 18, 21	...do.....	...do.....	Do.
15. Spinning and spinning-room calculations.	...do.....	1	8, 17	...do.....	...do.....	Do.
16. Cotton-mill arithmetic and card-room calculations.	...do.....	1	15, 16	...do.....	Poe Manufacturing Co.	Greenville, S. C.
17. Weaving and weave-room calculations.	...do.....	1	18, 21	...do.....	...do.....	Do.
18. Designing and cloth analysis.	...do.....	1	29	...do.....	...do.....	Do.
19. General continuation.	Part-time, dull season.	2	.....	Teacher.....	Exposition Cotton Mills.	Atlanta, Ga.
20. Carding, spinning, and weaving.	Evening..	5	(¹)	Mill teacher.....	West Point Manufacturing Co.	Janett, Lanark, Shawmut, Riverview, and Fairfax, Ala. Greenville, S. C.
21. Weaving and weave-room calculations.	...do.....	1	18, 21	Overseer.....	Woodside Cotton Mill.	Do.
22. Carding and card calculations.	...do.....	1	4, 16	...do.....	...do.....	Do.
23. Combined textile course.	...do.....	3	.....	Textile expert...	Shelby Cotton Mill, Ella Manufacturing Co., Lilly M. & P. Co.	Shelby, N. C.
24. Cotton-mill arithmetic.	...do.....	1	15	Assistant to superintendent.	American Cotton Mills.	Greenville, S. C.
25. Card, spinning and weave-room calculations.	...do.....	1	16, 17, 18	Overseer.....	...do.....	Do.
26. Carding and card-room calculations.	...do.....	1	4, 16	...do.....	Pacific Mills.....	Columbia, S. C.

¹ Correspondence course.

Existing schools and classes—Continued.

Name of course.	Type of organization.	Number of classes.	Textile unit No.	Teacher.	Mill.	City.
27. Cloth analysis and designing, and weave-room calculations.	Evening..	1	27, 18	Overseer.....	Pacific Mills....	Columbia, S. C.
28. Cotton mill arithmetic.	...do.....	1	15	Assistant superintendent.	....do.....	Do.
29. Carding and card-room calculations.	...do.....	1	4, 16	Overseer.....	Union Mills.....	Union, S. C.
30. Spinning and spinning-room calculations.	...do.....	1	8, 17	....do.....	....do.....	Do.
31. Weaving and weave-room calculations.	...do.....	1	18, 21	Superintendent.	....do.....	Do.
32. Plain loom fixing and jacquard loom fixing.	...do.....	1	22, 30	Overseer.....	Rosemary Manufacturing Co.	Roanoke Rapids, N. C.
33. Weaving.....	Part-time Vestib.	3	.....	Operative.....	....do.....	Do.
34. Spinning.....	...do.....	3	.....	....do.....	....do.....	Do.
35. Carding and card-room calculations.	Evening..	1	4, 16	Textile graduate	Monarch Mills...	Union, S. C.
36. Spinning and spinning-room calculations.	...do.....	1	8, 17	Overseer.....	....do.....	Do.
37. Opening, carding, spinning, weaving, and calculations.	...do.....	1	3, 4, 8, 21, 16, 17, 18	....do.....	Arcade Cotton Mills.	Rock Hill, S. C.
38. Loom fixing and calculations.	...do.....	1	22, 18	....do.....	Manchester Mills, Aragon Mills.	Do.
39. Combined textile course.	...do.....	2	.....	Textile expert...	All mills of the city (5).	Lumberton and East Lumberton, N. C.
40. Do.....	...do.....	1	.....	....do.....	Erlanger Mill....	Lexington, N. C.

NOTE.—There are several other centers in Georgia and South Carolina with classes pending, but not in actual operation at time the report was made.

PART III.

OUTLINES OF SHORT-UNIT COURSES IN EVENING AND
PART-TIME CLASSES FOR TEXTILE WORKERS.

Part III.—OUTLINES OF SHORT-UNIT COURSES IN EVENING AND PART-TIME CLASSES FOR TEXTILE WORKERS.

1. USE OF OUTLINES.

These outlines are in no sense intended to be complete or to take the place of reference books and properly prepared lesson sheets. In the establishment of some 50 textile classes in connection with the investigations which have resulted in this report, it was found desirable to use practical overseers, second hands, and section men as instructors. These men, with a thorough practical knowledge of the machines and their operation but without previous training as teachers, were found to be in need of suggestions as to what subject matter should be given their classes. The outlines following served to suggest topics which the instructors were able to enlarge upon out of their own experience. These outlines have served the purpose in the hands of these instructors. It is the aim, therefore, in presenting these short-unit courses in this topical form as suggestions to others, to lay out a rather complete program in order to point out the wide range of possibilities. Thus, a welcome signal is held out to many interests in the industry, rather than concentrating upon a few.

It is impossible in this short report to prepare detailed lesson sheets for each line of work suggested. It is recognized, however, that such steps are absolutely essential for properly handling the work in the future, and if the demand develops by a widespread participation of the textile industry in vocational education the Federal Board will in all probability issue more complete and detailed lessons on the unit courses shown to be most in demand. This list of short-unit courses is therefore to be taken rather as a summary, leaving it to subsequent developments to provide details of subject matter and methods of instruction. It is hoped that this general bulletin will be followed by special lesson sheets for use in textile classes. In the use of the outlines which follow, instructors are cautioned against making the work collegiate. It is to be remembered that the instruction is for operatives on a production job, operatives who in many instances can little more than read and write. The topics suggested for the instructor in condensed form in the outlines must therefore be treated in the simplest manner possible. Technical terms will be omitted and simple mill terms used. Calculations will necessarily have to be simplified to come within the understanding of the particular group instructed, and all instruction reduced to its most ele-

mentary level. Attention is called to the fact that the average southern cotton mill operative has attained a general education previous to his entrance upon employment equivalent to about the third grade of the elementary school. This necessitates simplicity as to methods of presentation and keeping the instruction strictly vocational in its nature.

With this background kept constantly in view, the following topical outlines are presented as suggestions for the teachers' use only.

Selection should be made with reference to the actual industrial needs in each local community. It is not intended that the entire list be given in any one locality. In the centers of instruction thus far established in these experiments the maximum number selected is only four or five short-unit courses here represented. In a representative school, however, this many should ordinarily be represented in each of the operating rooms. Thus during the year the card operatives would have a progressive course from which selections could be made. The same is true of the spinning room, the weave room, and other departments.

TEXTILE UNIT 1.—PROGRESSIVE SURVEY OF THE PROCESSES, SHOWING THE RELATIONSHIP BETWEEN STEPS IN MANUFACTURING PRODUCT.

10 LESSONS.

NOTE.—This short-unit course has for its aim acquainting the workers of all departments with the mill as a whole. Specifically its object is to show how one operative's work affects that of another in obtaining a perfect product. In each department consideration is given to (1) cleanliness, (2) waste, (3) effect of imperfect work, and (4) the finished product. A quick survey through the mill is intended. A study of the various machines and their operation are cared for in subsequent short-unit courses, detailed work not being the object in this particular unit. The course was suggested at a conference of practical mill superintendents and unanimously agreed upon as being desirable in southern mills and essential for mill workers to insure greatest efficiency in production. It is recommended that it be given previous to the detailed study of machines and their operations as provided for in the other courses which follow:

A. Bale breaker:

- (a) Form in which cotton is received.
- (b) Work of this machine.
- (c) Imperfect work and its effect at future processes.
- (d) Form of finished product.

B. Pickers:

- (a) Cleanliness.
- (b) Waste removed.
- (c) Imperfect work and its effect at future processes.
- (d) Form of finished product.

C. Cards:

- (a) Cleanliness.
- (b) Kinds of waste removed.
- (c) Places at which waste is removed.
- (d) Imperfect work and its effect at future processes.
- (e) Form of finished product.

- D. Sliver lap:
 - (a) Cleanliness.
 - (b) Imperfect work and its effect at future processes.
 - (c) Form of finished product.
- E. Ribbon lap:
 - (a) Cleanliness.
 - (b) Waste.
 - (c) Imperfect work and its effect at future processes.
 - (d) Form of finished product.
- F. Comber:
 - (a) Cleanliness.
 - (b) Waste removed.
 - (c) Imperfect work and its effect at future processes.
 - (d) Form of finished product.
- G. Drawing frames:
 - (a) Cleanliness.
 - (b) Imperfect work and its effect at future processes.
 - (c) Form of finished product.
- H. Roving frames:
 - (a) Cleanliness.
 - (b) Systems for increased production.
 - 1. Creeling.
 - 2. Doffing.
 - (c) Imperfect work and its effect at future processes.
 - (d) Form of finished product.
- I. Spinning frames.
 - (a) Cleanliness.
 - (b) Imperfect work and its effect at future processes.
 - (c) Form of finished product.
- J. Spooling:
 - (a) Cleanliness.
 - (b) Imperfect work and its effect at future processes.
 - (c) Form of finished product.
- K. Warping:
 - (a) Cleanliness.
 - (b) Imperfect work and its effect at future processes.
 - (c) Form of finished product.
- L. Slashing:
 - (a) Cleanliness.
 - (b) Imperfect work and its effect at future processes.
 - 1. Size.
 - 2. Leases.
 - 3. Machine.
 - (c) Waste.
 - (d) Form of finished product.
- M. Weaving:
 - (a) Cleanliness.
 - (b) Imperfect work and its effect on the value of the cloth.
 - (c) Form of finished product.
- N. Cloth room:
 - (a) Cleanliness.
 - (b) Detection of imperfections.
 - (c) Form of finished product.

TEXTILE UNIT 2.—COTTON SAMPLING AND GRADING.

10 LESSONS, SHOP COURSE.

NOTE.—This short-unit course can be given in considerably less time than 10 lessons if the aim is merely to demonstrate how cotton sampling and grading is done. If, however, the pupils are expected to acquire the ability and skill to actually grade the most common of the standard types, 10 lessons under expert supervision will barely be enough to put them on the road to learning. Long and continued practice and experience after the preliminary instruction period has ended will be necessary for acquiring expert skill in grading cotton.

- (a) Weigh and tag the bales as they are received at the mill or warehouse.
- (b) Pull samples from the bale until you obtain a smooth sample.
- (c) Find the length of the cotton by pulling the staple. These samples should be taken from bales of different grades and lengths of staple.

Select first middling cotton, then good middling, and finally low middling. Practice with these three grades until the student is able to recognize each with ease, after which mix into the same lot of samples some strict middling and strict low middling. Practice on these five grades until the student can properly arrange the bales representing the respective grades. A knowledge of these five grades covers the bulk of the American cotton crop.

- (d) Grade these samples by comparing with the Government standard types:

- Middling fair.
- Strict good middling.
- Good middling.
- Strict middling.
- Middling.
- Strict low middling.
- Low middling.
- Strict good ordinary.
- Good ordinary.

- (e) Judge the cotton for its spinning value.

TEXTILE UNIT 3.—OPENING AND PICKING.

8 LESSONS, SHOP COURSE.

A. The hopper bale breaker:

- (a) Remove, clean, and replace the spiked lifting lattice, the spiked evenner roll, the bottom lattice, and the doffing stripper.
- (b) Adjust the bale breaker to reduce the pounds going through it.
 - (1) By changing the surface speed of the lifting lattice.
 - (2) By changing the position of the spiked evenner roll in regard to the spiked lifting lattice.
 - (3) Compare the results of the two methods.

B. Conveying apparatus:

- (a) Compare the pneumatic or blower conveyor with the lattice system.
 - (1) For long and short distances from the opening room.
 - (2) For cleaning action.
 - (3) For the removal of the impurities from the trunks.
 - (4) For connecting with the picker.

C. Automatic or hopper feeder:

- (a) Remove, clean, and replace the spiked lifting lattice, the spiked evenner roll, the bottom traveling lattice, and the doffing stripper.
- (b) Set the evenner stripper to feed a heavy amount of cotton.
- (c) Set the evenner stripper to reduce the amount of cotton feed.
- (d) Reduce the size of the lumps passing through the machine by regulating the speed of the evenner stripper roll.

D. Pickers:

- (a) Compare the different types of beaters and the class of work for which they are best fitted.
- (b) Set the feed rolls to the beater for different lengths of cotton.
- (c) Set the grid bars to remove the maximum amount of waste.
- (d) Set the grid bars to remove the minimum amount of waste.
- (e) Tear down, clean, and replace the evener motion.
- (f) Adjust to allow the maximum movement of the cope belt.
- (g) Prevent split laps by controlling the air current.
- (h) Remove, clean, and adjust the feed-clutch control.
- (i) Remove, clean, and replace the calender rolls, making the necessary adjustments.
- (j) Lay out a system of cleaning and oiling for the picker room.
- (k) The effect of imperfect work in the picker room on succeeding processes.
- (l) Oiling.

TEXTILE UNIT 4.—CARDING.**12 LESSONS, SHOP COURSE.**

- (a) The purpose of the card and how its work is accomplished.
- (b) Prepare a card for grinding.
 - (1) Cut out the feed.
 - (2) Strip the cylinder and the doffer.
 - (3) Allow the flats to run three-quarters of an hour to strip.
 - (4) Disconnect and remove the necessary parts to permit the use of the quick traverse grinders, and allow for the difference in the doffer drive.
- (c) Gauge the grinders carefully on each side. Determine when the card has been properly ground.
- (d) After the required sharpness has been obtained, remove the grinders, clean the machine, and set the following parts:
 - (1) Cylinder screen from the cylinder.
 - (2) Licker-in from the cylinder.
 - (3) Mote knives from the licker-in.
 - (4) Feed plate from the licker-in.
 - (5) Licker-in screen from the licker-in.
 - (6) Back knife plate from the cylinder.
 - (7) Doffer from the cylinder.
 - (8) Doffer comb from the doffer.
 - (9) Front knife plate from the cylinder.
 - (10) Flats from the cylinder.

NOTE.—The flats can be set from the cylinder by either of two methods: 1. By removing one flat on both sides of the setting or high flat and turning from one setting point to the other until the setting is completed. 2. By removing every eighth flat until five have been removed, turn these openings until they stand approximately over the setting points and then set in the usual way. The latter method is the one most used in practice.

(e) Start cotton through the card and when it is working properly place the long grinder in position and grind the flats.

(f) The effect of the weather and humidity upon the raising or lowering of the doffer comb.

(g) Lay out a system of—

- (1) Stripping.
- (2) Cleaning.
- (3) Oiling.
- (4) Grinding.
- (5) Setting.

- (h) Card clothing.
 - (1) The foundation.
 - (2) Styles of points.
 - (3) Methods of grinding the points.
 - (4) Number of wire to use on—
 - (a) The cylinder.
 - (b) Doffer.
 - (c) Flats for different classes of cotton.

TEXTILE UNIT 5.—COMBING.

16 LESSONS, SHOP COURSE.

- A. The sliver lap:
 - (a) Tear down, clean, and replace the sliver lap machine.
 - (b) The drawing rolls.
 - (1) When sliver lap is used with the ribbon lap.
 - (2) When sliver lap only is used.
 - (3) The setting and weighting.
 - (c) The stop motions.
 - (1) Back.
 - (2) Full lap.
 - (d) The care of the sliver lap.
 - (1) Cleaning.
 - (2) Oiling.
- B. The ribbon lap.
 - (a) Tear down, clean, and replace the ribbon lap.
 - (b) The drawing rolls.
 - (1) Setting.
 - (2) Weighting.
 - (3) Clearers.
 - (c) The stop motion.
 - (1) Back.
 - (2) Full lap.
 - (d) The care of the ribbon lap.
 - (1) Cleaning.
 - (2) Oiling.
- C. The comber.
 - (a) The operation and construction of the comber.
 - (b) Tear the comber down to the upright stands, clean, and level the frame.
 - (c) Replace the following parts:
 - (1) Nipper shaft.
 - (2) Cylinder shaft, short section.
 - (3) Driving shaft.
 - (4) Cam shaft.
 - (5) Notched wheel shaft.
 - (d) The actuating cams.
 - (1) Timing.
 - (2) Setting.
 - (e) Align the steel detaching roll with the segments.
 - (f) Set and time the cylinders.
 - (g) Set and time the feed rolls.
 - (h) Set the brushes to the cylinder and connect the gearing.
 - (i) Set and time the lifter blocks.
 - (j) Assemble and set the nipper frames.

C. The comber—Continued.

- (k) Set the connecting rods.
- (l) Time the nipper cams.
- (m) Set the top combs.
- (n) Set the doffer combs to the brushes.
- (o) Set the doffer combs and bonnets.
- (p) Time the steel detaching roll.
- (q) Set the brass clearing roll.
- (r) Set the draw-box rolls and replace the weights.
- (s) Start cotton through the machine.
- (t) Take per cent of waste.
- (u) Lay out systems of cleaning and oiling.

TEXTILE UNIT 6.—DRAWING FRAMES.**5 LESSONS, SHOP COURSE.**

- (a) The purpose of the drawing frame and how its purpose is attained.
- (b) Leather-covered top rolls.
 - (1) The different types of construction.
 - (2) The different methods of weighting them.
 - (3) The varnishing and care of the rolls.
 - (4) The proper settings to use for different lengths and weights of cotton.
- (c) Metallic drawing rolls.
 - (1) The difference in construction for the same work, but different rolls.
 - (2) The wider setting necessary, and the reasons.
 - (3) Compare with leather-top rolls in regard to upkeep.
- (d) Electrical and mechanical stop motions and their proper adjustment.
- (e) The construction and use of the different types of clearers for the top and bottom rolls.
- (f) The tension gear and its purpose.
- (g) Cleaning and oiling.

TEXTILE UNIT No. 7—ROVING FRAMES.**10 LESSONS, SHOP COURSE.**

- (a) Description of the roving frame, and the distinction between the processes.
- (b) An analysis of the three principal operations.
 - (1) The drawing of the roving.
 - (2) The twisting of the roving.
 - (3) The winding of the roving after it has been drawn and twisted.
- (c) The construction and methods of setting the top roll bearings, or cap bars.
- (d) The methods of weighting the top drawing rolls.
- (e) The settings to use for the top and bottom drawing rolls, which are governed by—
 - (1) The different lengths of staple.
 - (2) The different weights of roving being fed.
 - (3) The amount of twist in the roving being fed.
- (f) The construction and purpose of clearers and the rolls with which they are used.
- (g) The purpose of the roving traverse motion and its proper operation.
- (h) Description of the spindle and its bearings.
 - (1) Self oiling step.
 - (2) Long and short bolsters.
 - (3) Systems of oiling spindles.

- (i) Description of the flyer and its component parts.
 - (1) Bodden.
 - (2) Dunn.
- (j) The purpose of the cones and differential.
- (k) The purpose, construction, and operation of the builder motion.
- (l) The reasons for changing the change gears, and their positions on the machine.
 - (1) Draft.
 - (2) Twist.
 - (3) Tension.
 - (4) Lay.
 - (5) Taper.
 - (6) Bottom cone.
- (m) The flexible bobbin gear drive.
 - (1) The horse head.
 - (2) The twin vertical shafts, chain drive.
- (n) The operation, setting, and control of the lifting and reversing motion.
- (o) Method of doffing a roving frame for maximum production.
- (p) Set the full bobbin stop motion.
- (q) The operation of the safety stop motion, when the reverse motion fails to work.
- (r) The operation of Erskine's cone stop motion.
- (s) Notes on roving frames:
 - (1) Worn rolls and their effect on the work.
 - (2) Bad and uneven roving.
 - (3) Proper way to piece up a broken end.
 - (4) Management of the bobbins in the creel.
 - (5) Systems of cleaning the frames.
 - (6) Systems of oiling the different parts of the frame.
- (t) Methods of reducing waste.

TEXTILE UNIT 8.—SPINNING FRAMES.

8 LESSONS, SHOP COURSE.

- (a) The purpose of the spinning frame.
- (b) An analysis of the principal operations.
 - (1) The drawing of the roving.
 - (2) The twisting of the yarn.
 - (3) The winding of the yarn.
- (c) The reasons for the different angles at which the roller stands incline the drawing rolls.
 - (1) Warp at 25°.
 - (2) Filling at 35°.
 - (3) Combination at 30°.
- (d) The methods of weighting top rolls.
 - (1) Lever weighting.
 - (2) Self weighting.
- (e) The different types of clearers and the style of roll with which they are used.
- (f) Remove, clean, and set the cop bars when using.
 - (1) Lever weighted top rolls.
 - (2) Self weighted top rolls.
- (g) The construction and adjustment of the thread board.
 - (1) Wooden.
 - (2) Metallic.

- (h) Description of the spindle:
 - (1) Base.
 - (2) Bolster.
 - (3) Step.
 - (4) Blade.
 - (5) Whirl.
 - (6) Bobbin cup.
 - (7) How to set the spindle.
- (i) The necessity for separators on warp frames with—
 - (1) Narrow gauge.
 - (2) High spindle speed.
 - (3) Long traverse.
- (j) The comparison of the different types of—
 - (1) Spinning rings, single and double flanged.
 - (2) Ring holders.
 - (3) Traveler cleaners.
 - (4) Size of rings used in different numbers of yarn.
 - (5) How to select the proper traveler cleaners.
 - (6) Results of worn or imperfect travelers.
- (k) The reasons the following conditions affect the size and weight of the traveler:
 - (1) Number of the yarn.
 - (2) Size of the ring.
 - (3) Speed of the spindle.
 - (4) Twist per inch inserted in the yarn.
- (l) The construction and operation of the builder motions.
 - (1) Warp.
 - (2) Filling.
 - (3) Combination.
- (m) Practice changing and setting the different change gears.
 - (1) Draft.
 - (2) Crown.
 - (3) Back roller.
 - (4) Front roller.
 - (5) Twist.
 - (6) Cylinder.
 - (7) Stud.
 - (8) Lay and ratchet gears.
- (n) Lay out systems for—
 - (1) Doffing.
 - (2) Cleaning.
 - (3) Oiling.
 - (4) Creeling.
- (o) Methods of reducing waste.

TEXTILE UNIT 9.—SPOOLING.

3 LESSONS, SHOP COURSE.

- (a) The purpose of the spooler.
- (b) The bobbin holders necessary for warp bobbins, filling bobbins, and cops.
- (c) The proper setting of the thread guides to remove slubs and bunches.
- (d) The various methods of banding the spindles.
- (e) The operation and adjustment of the builder motion.
- (f) The automatic knitter.
- (g) The method of marking the spools.

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- (h) The amount of waste made at this process.
- (i) The relation between the number of spindles per operator and the counts of the yarn.
- (j) Methods of reducing waste.

TEXTILE UNIT 10.—WARPING.

3 LESSONS, SHOP COURSE.

- (a) The slow and fast driving mechanism of the warper.
- (b) The correct threading of the warper.
- (c) The operation and setting of the broken end stop motion.
 - (1) Mechanical.
 - (2) Electrical.
- (d) The operation and setting of the measuring motion.
- (e) The operation of the slack roll.
 - (1) Rising.
 - (2) Falling.
- (f) The necessity of making warps of uniform length.
- (g) The faults due to imperfect expansion comb and adjustment of same.
- (h) Doffing.

TEXTILE UNIT 11.—SLASHING.

5 LESSONS, SHOP COURSE.

- (a) The purpose of the slasher.
- (b) The aligning of the beams in the racks.
- (c) The proper method of threading the slasher.
- (d) The correct method of inserting the lease strings.
- (e) The adjustment of the expansion comb to the width of the loom beam.
- (f) The purpose of the size kettle and the size box.
- (g) The composition of size compounds.
- (h) The adjustment of the cut marker to different lengths of cloth.
- (i) The use of steam in the slasher.
- (j) The purpose of the cones.
- (k) The slow and fast driving mechanism.
- (l) The amount of waste due to the following conditions:
 - (1) Number of the yarn.
 - (2) Skill of the slasher tender.
 - (3) Number of ends per loom beam.
 - (4) Kinds of waste.
- (m) Calculations for amount of sizing added.

TEXTILE UNIT 12.—REELING.

3 LESSONS, SHOP COURSE.

- (a) The construction of the swift.
 - 1. Adjustment for size.
 - 2. Doffing.
 - (a) Wheel method.
 - (b) Collapsible method.
- (b) The traverse motion.
 - 1. Plain.
 - 2. Cross.

- (c) The measuring motion.
 - 1. Operation.
 - 2. Adjustment.
- (d) The methods of tying skeins.
- (e) The creel spindles.
 - 1. Dead.
 - 2. Live.

TEXTILE UNIT 13.—WINDING.

3 LESSONS, SHOP COURSE.

- (a) The purpose of tube and cone winding.
- (b) The yarn guide.
- (c) The variable speed mechanism.
- (d) The tension adjustment for different counts of yarn.
- (e) The pressure adjustment for different counts of yarn.
- (f) The stop motion adjustment.
 - (1) For broken end.
 - (2) For full tube or cone.

TEXTILE UNIT 14—TWISTING.

6 LESSONS, SHOP COURSE.

- (a) The various methods of preparing yarn for twisting.
 - (1) Spools.
 - (2) Tubes with 1, 2, or more ends per tube.
 - (3) Beams.
- (b) The difference in construction necessary when twisting wet and dry.
- (c) The three methods of wetting the yarn.
 - (1) American.
 - (2) Scotch.
 - (3) English.
- (d) The direction and amount of twist necessary in each intermediate step when making ply and cabled yarn.
- (e) The cams and adjustments necessary to produce the different winds.
- (f) The appliances necessary to produce novelty yarns.
- (g) The description of the spindle.
 - (1) Base.
 - (2) Step.
 - (3) Bolster.
 - (4) Blade.
 - (5) Brake.
- (h) The effect the following conditions have upon the size and weight of the traveler.
 - (1) Number of the yarn.
 - (2) Speed of the spindle.
 - (3) Size of the ring.
 - (4) Twist per inch inserted in the yarn.
- (i) The systems of
 - (1) Cleaning.
 - (2) Oiling.
 - (3) Doffing.
 - (4) Creeling.

TEXTILE UNIT 15.—COTTON MILL ARITHMETIC.

48 LESSONS.

- (a) Addition, multiplication, subtraction, and division in mill terms; ends of warp, bobbins of filling, cans of sliver, and doffs of roving.
- (b) Decimals and their practical application to mill calculations.
- (c) Proportion in terms of speed, pulleys, and gears.
- (d) Table of lengths; inches, yards, skeins, and hanks.
- (e) Table of weights; grains, ounces, and pounds.
- (f) Simple yarn calculations.
 - (1) Find the counts when the length and weight are known.
 - (2) Find the length when the weight and counts are known.
 - (3) Find the weight when the counts and length are known.

TEXTILE UNIT 16.—CARD ROOM CALCULATIONS.

10 LESSONS.

A. Picker calculations.

- (a) Find the draft.
 - (1) From the gearing.
 - (2) From the amount of cotton fed and delivered in a certain length of time or per yard of stock.
- (b) Find the draft gear.
- (c) Find the draft constant.
- (d) Find the production.
- (e) Find the length of lap.
- (f) Find the gear required to give a certain length of lap.
- (g) Find the constant for length of lap.
- (h) Waste.

B. Card calculations.

- (a) Find the draft.
 - (1) From the gearing.
 - (2) From the weight of the lap, sliver, and per cent of waste.
- (b) Find the draft gear.
- (c) Find the draft constant.
- (d) Find the production.
- (e) Find the production gear.
- (f) Find the production constant.
- (g) Find production by short method.
- (h) Waste.

C. Drawing frame calculations.

- (a) Find the draft.
 - (1) From the gearing.
 - (2) From the weight of sliver fed and delivered in a certain length of time.
- (b) Find the draft gear.
- (c) Find the draft constant.
- (d) Find the production.
- (e) Find weight of sliver delivered, when the weight of sliver fed, the doublings, and the draft are given.
- (f) Find weight of sliver fed, when the doublings, the draft, and the weight delivered are known.

D. Comber calculations.

- (a) Sliver lap.
 - (1) Find the draft.
 - (2) Find the draft gear.
 - (3) Find the draft constant.
 - (4) Find the production.
- (b) Ribbon lap.
 - (1) Find the draft.
 - (2) Find the draft gear.
 - (3) Find the draft constant.
 - (4) Find the production.
- (c) Comber.
 - (1) Find the draft.
 - (2) Find the draft gear.
 - (3) Find the draft constant.
 - (4) Find the production.
 - (5) Find the per cent of waste.

E. Roving frame calculations.

- (a) Find the draft.
 - (1) From the gearing.
 - (2) From the counts from the roving fed and delivered, also the doublings.
- (b) Find the draft gear.
 - (1) From the gearing and draft.
 - (2) From the draft constant, and draft required.
- (c) Find the draft constant.
 - (1) From the gearing.
 - (2) From the draft and draft gear being used.
- (d) Find the hank roving required in the creel to make a certain hank, when the draft and couplings are known.
- (e) Find the twist.
 - (1) From the gearing.
 - (2) From the hank roving and the twist multiplier.
 - (3) From the twist gear and the twist constant.
- (f) Find the twist gear.
 - (1) From the gearing and twist.
 - (2) From the twist constant and the twist required.
 - (3) From the twist gear being used, the hank being made, and hank required.
- (g) Find the lay gear when changing from one hank to another.
- (h) Find the tension gear when changing from one hank to another.
- (i) Find the production.
 - (1) From the revolutions per minute and diameter of front roll, the hank roving, the per cent of stoppage, and the time run.
 - (2) From the revolutions per minute of the spindles and the twist.
 - (3) From the hand clock.
- (j) Find the production constant.
- (k) Find the wage due each operative.
 - (1) Day work.
 - (2) Piecework.

TEXTILE UNIT 17.—SPINNING ROOM CALCULATIONS.

8 LESSONS.

A. Draft calculations.

- (a) Find the draft.
 - (1) From the gearing.
 - (2) From roving being fed and yarn being made.
- (b) Find the draft constant.
- (c) Find the draft gear.
 - (1) When the draft and draft constant are known.
 - (2) When changing from one number to another, the draft and roving both being changed.
 - (3) When changing from one number to another, without changing the roving.

B. Twist calculations.

- (a) Find the twist.
 - (1) From the gearing.
 - (2) From twist multiplier and yarn to be made.
- (b) Find twist constant.
- (c) Find twist gear.
 - (1) When the twist and twist constant are known.
 - (2) When changing from one number to another.
 - (3) When the frame has a double or compound twist gear.

C. Productions calculations.

- (a) Find the production.
 - (1) When the revolutions per minute and diameter of the front roll, also the counts of yarn being made, are known.
 - (2) When the revolutions per minute of the spindles, the twist, and the counts of the yarn are known.
 - (3) Short method.

D. Traveler calculations.

- (a) The size traveler required when changing from one number of yarn to another.

E. Builder calculations.

- (a) The number of teeth required when changing from one number of yarn to another.

F. Reading tables.

- (a) Breaking strength.
- (b) Yarn numbers.
- (c) Travelers.
- (d) Drafts.
- (e) Draft gears.
- (f) Twists.
- (g) Twist gears.
- (h) Production.
- (i) Wages.
- (j) Humidity.

G. Figuring the pay roll.

- (a) Day work.
- (b) Piecework.

TEXTILE UNIT 18.—WEAVE ROOM CALCULATIONS.

12 LESSONS.

- (a) Find pick gear to give picks per inch required.
 - (1) When the gear is a driver.
 - (2) When the gear is driven.
- (b) Find pick gear constant.
 - (1) When the gear is a driver.
 - (2) When the gear is driven.
- (c) Find the production when the picks per minute, picks per inch, and yards per pound are known.
- (d) Find the production from production constant.
- (e) Find the number of ends required in a warp, when the sley and width at the reed are known.
- (f) Find the sley cloth a reed will weave, when the width and total dents are known.
- (g) Find the width in the reed when weaving plain cloth.
- (h) Find the weight of filling in a given length of cloth.
- (i) Find the weight of each color of filling in a checked gingham when the picks per pattern, picks per inch, width at the reed, and counts of the filling are known.
- (j) Find the weight of each filling for a given length of cloth, when two different counts of filling are used.
- (k) Find the warp contraction by various methods.
- (l) Find the average number when the sley, picks, counts of warp, and filling are known.
- (m) Find the average number when the number of ends, picks per inch, the width at the reed, and the yards per pound are known.
- (n) Find the yards per pound from small samples of cloth.
- (o) Find the counts of filling required to govern the yards per pound, when the sley, picks per inch, and counts of warp, width, and yards per pound are known.
- (p) Find the per cent of warp and filling in the cloth, using several different facts.

TEXTILE UNIT 19.—MULE SPINNING.

24 LESSONS, SHOP COURSE.

- (a) Description of headstock and parts.
- (b) Description of carriage and parts.
- (c) Belt shipper locking rod.
 - (1) Setting and timing with the carriage.
 - (a) At the beam.
 - (b) Going out from beam.
 - (c) Out.
 - (d) Going into beam.
- (d) Drawing out.
 - (1) Operation of drawing out drive when—
 - (a) Drawing out.
 - (b) Drawing in.
 - (2) Setting and timing of clutch on back shaft.
 - (3) Function of each scroll on scroll shaft.
 - (4) Construction of the scrolls.
 - (5) Adjustment of band tension.
 - (6) Squaring bands.

- (e) Jacking motion.
 - (1) Operation.
 - (2) Source of power.
 - (3) Setting and timing.
- (f) Easing-up motion.
 - (1) Necessity for easing up motion.
 - (2) Source of power for driving carriage.
 - (3) Setting and timing.
- (g) Backing off.
 - (1) Operation and backing off.
 - (2) Setting and timing.
- (h) Drawing in.
 - (1) Operation of drawing-in drive.
 - (2) Setting and timing of drawing-up friction.
 - (3) Locking arrangement.
- (i) Drawing rolls.
 - (1) Construction.
 - (2) Methods of weighting.
 - (3) Setting the rolls for different lengths and kinds of cotton.
 - (4) Clearers used.
 - (5) Source of power and operation of the rolls when—
 - (a) Spinning or drawing out.
 - (b) Jacking.
 - (c) Backing off.
 - (d) Winding or drawing in.
- (j) Spindles.
 - (1) Construction.
 - (a) Blade.
 - (b) Step.
 - (c) Whirl.
 - (d) Angle.
 - (2) Driving mechanism when—
 - (a) Spinning or drawing out.
 - (b) Jacking.
 - (c) Backing off.
 - (d) Winding or drawing in.
- (k) The quadrant.
 - (1) Construction and operation.
 - (2) Control over the movement of the spindles.
 - (3) Setting and timing.
 - (4) Nosing motion.
 - (a) When used.
 - (b) Why used.
 - (5) Automatic control of nut.
 - (6) Necessity for having the quadrant indirectly driven from the carriage.
- (l) Counter and winding faller.
 - (1) Function of each.
 - (2) Setting and timing—
 - (a) To lock them.
 - (b) To unlock them.

- (m) Builder motion.
 - (1) Copping rail.
 - (a) Construction.
 - (b) Function.
 - (c) Control over copping faller.
 - (d) Shoes.
 - (e) Setting and timing the rail and shoes.
 - (f) Method of operating.
 - (g) Defects in shape of cop and how corrected.

TEXTILE UNIT 20.—ELEMENTARY DESIGNING AND CLOTH ANALYSIS.**24 LESSONS.**

- (a) Represent warp and filling ends on design paper.
- (b) Represent the plain weave on design paper.
- (c) Pick apart a number of pieces of plain cloth, with the aid of the pick glass, and place the weaves on design paper.
- (d) Represent a simple 3-end twill on design paper.
- (e) Analyze pieces of twill cloth and transfer the weaves to design paper.
- (f) Represent a sateen weave on design paper.
- (g) Analyze pieces of sateen cloth and transfer the weaves to design paper.
- (h) Arrange the cams and harness rollers for—
 - (1) Plain weaves.
 - (2) Twill weaves.
 - (3) Sateen weaves.
- (i) Design and analyze the following weaves:
 - (1) Plain.
 - (a) Basket.
 - (b) Honeycomb.
 - (c) Warp rib.
 - (d) Filling rib.
 - (2) Twill.
 - (a) Regular-warp and filling flush, even, and uneven sided.
 - (b) Curved.
 - (c) Skip.
 - (d) Pointed.
 - (e) Entwining, right and left hand.
 - (3) Sateens.
 - (a) Warp flush.
 - (b) Filling flush.
 - (4) Miscellaneous.
 - (a) Stripes.
 - (b) Spots.
 - (c) Simple ornamentation.
- (j) Reduce the weaves to the smallest number of harnesses, and make a drawing—in draft.
 - (1) Plain weave on 2, 4, and 6 harnesses.
 - (2) Five end twill.
 - (3) Six end sateen.
- (k) Make chain drafts for the different weaves.

TEXTILE UNIT 21.—PLAIN WEAVING.

6 LESSONS, SHOP COURSE.

- (a) Start and stop the loom.
- (b) Find the correct shed for the filling.
- (c) Place the shuttle in the correct shuttle box.
- (d) Draw-in ends on plain looms weaving.
 - (1) Plain weave on 2 harnesses.
 - (2) Plain weave on 4 harnesses.
 - (3) Five-end twill.
 - (4) Six-end twill.
 - (5) Stripes.
 - (6) Spots.
 - (7) Dimity cords.
- (e) Clean and oil the loom.

TEXTILE UNIT 22.—PLAIN LOOM FIXING.

14 LESSONS, SHOP COURSE.

- (a) Tear down and rebuild a plain loom.
- (b) Set the harness cams for time and position for plain work.
- (c) The cone picking motion.
 - (1) Set the cam for the time and position.
 - (2) Explain the parallel motion.
 - (3) Describe the proper adjustment of the lug strap, picker, and picker stick.
 - (4) Explain why this motion if worn or improperly set causes the loom to bang off.
- (d) The bat wing picking motion—adjustment for time and position. (Very little used on cotton looms.)
- (e) Assemble the harness cams and rollers for simple weaves, five and twill, and six and sixteen.
- (f) Adjust the lay for the correct beating up of the cloth.
 - (1) Set level for the shuttle.
 - (2) Set parallel with the breast beam for the filling.
- (g) The various let-off motions.
 - (1) Friction.
 - (2) Automatic.
 - (3) Bartlett.
 - (4) Morton.
- (h) The different take-up motions.
 - (1) Positive.
 - (a) Intermittent.
 - (b) Continuous.
 - (2) Negative (not usual on cotton looms).
- (i) Shuttles and shuttle boxes.
 - (1) Pair the shuttles.
 - (2) Adjust the shuttle boxes to the shuttles.
 - (3) Compare the front with the back binder or swell.
- (j) Explain and adjust the protection device.
- (k) Explain and adjust the filling stop motion.
- (l) Put in a tape selvage motion and adjust for time and position.

(m) Draper automatic loom.

- (1) Explain the Draper filling changing device.
- (2) Adjust the motion for time and position.
- (3) Explain and adjust the shuttle position detector.
- (4) Compare the shuttle used on this loom with the common shuttle.
- (5) Explain the necessity for a warp stop motion on an automatic loom.
- (6) Set the warp stop motion; either electrical or mechanical.
- (7) Explain the feeler motion and its adjustment to prevent thin places and mispicks.

(n) Stafford "Ideal" automatic loom.

- (1) Set the magazine shaft.
- (2) Set conveyor top.
- (3) Set magazine.
- (4) Set ejector.
- (5) Set receiver box.
- (6) Set warp stop motion.
- (7) Set safety lever lock.

TEXTILE UNIT 23.—INSPECTION OF THE WOVEN CLOTH.**3 LESSONS, SHOP COURSE.**

- (a) The lengths of cloth received from the weave room.
- (b) The reasons for sewing them together.
- (c) The brusher.
 - (1) Set the knife blades.
 - (2) The rolls covered with card clothing.
- (d) The purpose of the calender.
- (e) The effect of the calender upon the finishing process.
- (f) The folder.
 - (1) The length of each fold.
 - (2) The length of the cloth folded.
 - (3) The inspection of the cloth.
- (g) The inspection of the table.
- (h) The grading of the cloth into—
 - (1) First quality.
 - (2) Seconds.
 - (3) Double cuts.
 - (4) Shorts.
 - (5) Remnants.
- (i) The weaver's inspection of bad work.
- (j) The final inspection.
- (k) The number of pieces per bale.
- (l) The cloth is weighed to check the average yards per pound.
- (m) The pressing and baling of the cloth.
- (n) Waste.

TEXTILE UNIT 24.—COTTON MILL MACHINERY.**(Organizations for various classes of goods.)****15 LESSONS.****A. Quality.**

- (a) Doublings.
- (b) Drafts.
- (c) Weights or counts.
- (d) Per cents of waste.

B. Machinery.

- (a) Production required at each process.
- (b) Production per delivery.
 - (1) Size of delivery.
 - (2) Speed of delivery.
- (c) Deliveries per room.
- (d) Deliveries per frame.
- (e) Frames per room.

C. Buildings.

- (a) Route the work.
- (b) Floor space per machine.
- (c) Floor space per room.

D. Operatives necessary at—

- (a) Each process.
- (b) Each room.
- (c) Mill.

TEXTILE UNIT 25.—COTTON MILL RECORDS AND REPORTS.

4 LESSONS.

A. Card-room reports.

- (a) Number of each kind of machine run.
- (b) Weights at each process.
- (c) Production.
- (d) Humidity.
- (e) Amount and kinds of waste.
- (f) Oil used.
- (g) Hands.
 - (1) Discharged.
 - (2) Hired.
 - (3) Out.
- (h) Machines stopped.
 - (1) Repairs.
 - (2) Stock.
 - (3) Hands out.

B. Spinning-room reports.

- (a) Number of machines on each kind of work.
- (b) Size of yarn.
- (c) Strength of warp yarn.
- (d) Production of each count.
- (e) Humidity.
- (f) Spooler production.
- (g) Warper production.
- (h) Amount and kinds of waste.
- (i) Average weight of beams.
- (j) Oil used.
- (k) Hands.
 - (1) Discharged.
 - (2) Hired.
 - (3) Out.
- (l) Machines stopped.
 - (1) Repairs.
 - (2) Stock.
 - (3) Hands out.

C. Weave-room reports.

- (a) Loom beams from slasher.
- (b) Beams drawn in.
 - (1) Hand.
 - (2) Machine.
- (c) Looms.
 - (1) Number of looms run on each style.
 - (2) Changes.
- (d) Cloth room.

D. Power department reports.

- (a) Engines.
- (b) Motors.
- (c) Pumps.
- (d) Condensers.
- (e) Boilers.
- (f) Fans.
- (g) Elevators.
- (h) Machine run in machine shop.

E. Miscellaneous reports.

- (a) Bales of cotton received.
- (b) Bales of cotton opened.
- (c) Slasher beams on floor.
- (d) Loom beams drawn in.
- (e) Loom beams not drawn in.

TEXTILE UNIT 26.—COST FINDING IN COTTON MILLS.**48 LESSONS.****1. Main items.**

- (a) Raw stock cost.
- (b) Labor cost.
- (c) Overhead charges.

2. Raw stock cost.

- (a) Value of stock put into operation during period.
- (b) Inventory at beginning and end of period.
- (c) Value of waste sold during period.

3. Labor cost in each room.

- (a) Piecework.
- (b) Daywork.
- (c) General expense or oversight.

4. Overhead charges.

- (a) Buildings, distributed on the basis of cost of each section.
- (b) Land, distributed on the basis of floor space occupied by each section.
- (c) Machinery, distributed on the basis of the cost of each section.
- (d) Power, distributed on the basis of horsepower used by each section.
- (e) Repair shop, distributed on the basis of labor cost expended on each section.
- (f) Office and storage, distributed on per cent basis that it bears to the total labor cost.

5. Assemble tabulated results.**6. Depreciation.**

TEXTILE UNIT 27.—FANCY CLOTH ANALYSIS AND DESIGNING.

24 LESSONS.

- (a) The description and analysis of gingham.
- (b) The restrictions imposed by the loom on the number of colors that may be used.
- (c) The necessity of keeping the designs to the proper size to admit of the proper spacing at the selvages. Correct division of patterns on both sides of cloth.
- (d) The chief features of Bedford cords.
 - (1) The different weaves employed in their construction.
 - (2) The economical use of wadding threads and their relation to production.
- (e) The analysis of these fabrics, with full instructions relating to contraction in either the gray or finished state.
- (f) The weights, counts, and costs.
- (g) Pile fabrics.
 - (1) Corduroys, the treatment of the cloth after it leaves the loom in order to produce the pile.
 - (2) Velveteens, the various methods of stitching.
 - (3) Velvets.
 - (4) Double, or two cloths woven at the same time.
 - (5) Methods of separating these cloths to produce the pile.
- (h) Lenos.
 - (1) Simple patterns.
 - (2) Fancy designs using various yarns.
 - (3) The full turn leno.
 - (4) The gauze reed and production of grenadines.
- (i) Warp and filling backed cloths.
 - (1) Double cloths, stitched and unstitched.
 - (2) Triple cloth and its proper stitching.
- (j) Designing Terry or Turkish towels to be woven on dobbies.

TEXTILE UNIT 28.—FANCY LOOM FIXING AND WEAVING.

12 LESSONS, SHOP COURSE.

A. Box motions.

- (a) The construction and operation of the box motion.
- (b) The connection of the picker stick with the shuttle boxes.
- (c) The box lifting lever.
- (d) The methods of raising and lowering the boxes.
- (e) The construction and operation of
 - (1) 2 by 1.
 - (2) 6 by 1.
- (f) The construction and operation of the multiplier motion.
- (g) The setting of the box and multiplier motions.
- (h) The regulations of the shuttles and binders.
- (i) The construction of box and multiplier chains.

B. Dobbies.

- (a) The advantages of the dobby shedding motion.
- (b) The open and closed shed.
- (c) The single cylinder dobby.
- (d) The single and double index dobby.
- (e) The pawl and ratchet drive for the chain cylinder.
- (f) The double cylinder dobby.

B. Dobbies—Continued.

(g) The worm drive used on double cylinder dobbies.

(1) Setting the clutch gears.

(2) Setting the multiplier motion.

(3) Paggings the pattern chain.

(h) The setting and timing of the knives.

C. Leno attachments.

(a) Lenos made on the single lift or close shed.

(b) Arrangement of the harnesses when using the bottom doup.

(c) Standard and doup harnesses.

(d) Right and left hand douns.

(e) Drawing-in the ends and reeding them properly.

(f) Operation of the harnesses.

(g) Construction of the pattern chain.

(h) Construction and operation of the slackener.

(i) Distinction between top and bottom douns.

(j) The weaving of plain cloth with douns.

(k) Lenos made on the double lift or open shed.

(l) The construction and operation of the yoke.

(m) The construction and operation of the jumper.

(n) The construction of the pattern chain for the proper operation of the harnesses, jumper, and yoke.

(o) The methods of cross weaving.

TEXTILE UNIT 29.—JACQUARD CLOTH ANALYSIS AND DESIGNING.**24 LESSONS.**

(a) Selecting the design paper.

(b) Casting out.

(1) To reduce machine size to design.

(2) To reduce ends per inch.

(c) Distributing the pattern.

(1) The nature of the ground weave.

(2) Arrangement of the figures and the areas they may occupy.

(3) Figures not square.

(4) Diagonals.

(5) Warp and filling figures.

(d) Sketching to exact size.

(e) Enlarging or reducing the sketch for design paper.

(f) Transferring the sketch to design paper.

(g) Designing patterns to economize and produce all-over effects.

(h) Shading the patterns.

(i) Designing original patterns.

TEXTILE UNIT 30.—JACQUARD LOOM FIXING AND WEAVING.**12 LESSONS, SHOP COURSE.**

(a) The purpose of the Jacquard.

(b) The classes of Jacquard machines.

(c) The methods of mounting the machine.

(d) The method of raising the hooks.

1. Single lift.

- (a) Set the griff for time and position.
- (b) Set the cylinder for time and position.
- (c) Disadvantages of the single lift machine.

2. Raise and drop.

- (a) Set the griff for time and position.
- (b) Set the cylinder for position.

3. Double lift—single and double cylinders.

- (a) Advantages and disadvantages of each system.
- (b) Set the griff for time and position.
- (c) Set the cylinder for time and position.
- (d) Fix and set the machine when
 - (1) The filling skips.
 - (2) The hooks miss.
 - (3) Ends floating on the face of the cloth.
- (e) Styles of harness ties.
- (f) The card cutting machine.
- (g) Cutting the cards.
- (h) Lacing the cards.

TEXTILE UNIT 31.—POWER AND ITS APPLICATION TO TEXTILE MACHINERY.

10 LESSONS.

(a) Power plants.

- (1) Engines.
- (2) Turbines.
- (3) Water wheels.

(b) Methods of transmitting power.

(1) Belt.

- (a) Side to use next pulley.
- (b) Way to run lap.
- (c) Lacing the belt.

(2) Rope.

- (a) First cost.
- (b) Evenness of the drive.
- (c) System of rope transmission.

(1) Several parallel ropes.

(2) One rope and one splice around pulleys as many times as necessary.

(3) Chain.

(4) Gearing.

(c) Motors.

- (1) Cleaning.
- (2) Oiling.
- (3) Care in starting.

(d) Types of hangers.

- (1) Care of hangers.
- (2) Oiling of hangers.
- (3) Cleaning hangers.

(e) Aligning of shafting and pulleys.

- (1) Parallel.
- (2) Quarter turn.

- (f) Systems of distributing power.
 - (1) Power plant and shafting.
 - (2) Motor for each room.
 - (3) Motor for each section.
 - (4) Individual motors.

TEXTILE UNIT 32.—TEXTILE CHEMISTRY AND DYEING.

24 LESSONS, SHOP COURSE.

- (a) Weighing and measuring.
- (b) Manipulation and use of
 - (1) Hydrometer.
 - (2) Thermometer.
 - (3) Pipette.
 - (4) Burette.
 - (5) Other simple apparatus.
- (c) Preparation of stock solution of known strength for—
 - (1) Testing.
 - (2) Use in dyeing.
- (d) Chemicals most commonly used.
 - (1) Special properties of each.
- (e) Testing of fiber and dyestuff.
 - (1) Methods of testing.
 - (2) Detection of dyestuff on fiber.
 - (3) Testing of fastness of dyestuffs.
 - (4) Examination of fiber.
- (f) Preparation of yarn and cloth for dyeing.
- (g) Dyeing machinery and its manipulation.
 - (1) Raw stock.
 - (2) Yarn.
 - (3) Piece goods.
- (h) Mercerizing of—
 - (1) Yarn in the hank.
 - (2) Warps.
 - (3) Piece goods.
- (i) Water.
 - (1) Suitable for dyeing.
 - (2) Purification.
- (j) General observations.
 - (1) Dissolving the dye.
 - (2) Production of level dyeing.
 - (3) Feeding the color.
 - (4) Standing bath.
 - (5) Mixing of dyes.
 - (6) Dyeing to shade.
 - (7) Defects in dyeing.
- (k) Direct cotton dyestuffs.
 - (1) Properties.
 - (2) Method of applying.
 - (3) Assistants.
 - (4) After treatment.
 - (a) Diazotizing and developing.
 - (b) Coupling.
 - (c) With metallic salts.

- (l) Sulphur dyestuff.
 - (1) Properties.
 - (2) Method of applying.
 - (3) After treatment.
- (m) Basic dyestuff.
 - (1) Properties.
 - (2) Application.
 - (3) Mordanting with tannic acid.
 - (4) Fixing with tannic acid.
 - (5) Defects in dyeing.
 - (6) Use in "lopping" direct and sulphur colors.
- (n) Acid dyestuffs.
 - (1) Properties.
 - (2) Application to cotton.
- (o) Mordant dyestuffs.
 - (1) Method of application.
 - (2) Natural mordant dyestuffs.
 - (3) Artificial mordant dyestuffs.
 - (4) Single-bath method.
 - (5) Mixing.
 - (6) Mixing and shading.
- (p) Vat dyestuffs.
 - (1) Properties.
 - (2) Application.
- (q) Insoluble colors produced on the fiber.
 - (1) Insoluble azo.
 - (2) Aniline black.
 - (3) Mineral.
- (r) Selection of dyestuffs for specific purposes.

TEXTILE UNIT 33.—BLEACHING AND FINISHING.

24 LESSONS, SHOP COURSE.

A. Bleaching.

1. Grey room.

- (a) The comparison of the mill yardage with the yardage received per bale.
- (b) The laying out of the bales.
 - (1) The weights of cloth to lay out together.
 - (2) The sewing together of the different bales.
 - (3) The skill required to sew the goods together correctly.
 - (4) The reasons for clipping after sewing.
 - (5) The marking of the cloth.
- (c) The preliminary finish for quality.
 - (1) Unsinged for quantity.
 - (2) Plate singeing for plain goods.
 - (3) Gas singeing for fancies.

2. Bleach and kier room.

- (a) The steeping of the goods.
 - (1) The reasons for steeping.
 - (2) The chemicals used for steeping.
- (b) The souring of the goods.
 - (1) The reasons for souring.
 - (2) The chemicals used for souring.

A. Bleaching—Continued.**2. Bleach and kier room—Continued.****(c) The boiling of the goods.**

- (1) The chemicals used.
- (2) The pressure used.
- (3) The length of time to boil.
- (4) The methods of squeezing.
- (5) The prevention of oxidation.

(d) The bleaching of the goods.

- (1) The chemicals used.
- (2) The method used.
- (3) The length of time to allow the cloth to remain in the solution.
- (4) The completion of the bleaching in the bins by oxidation.
- (5) The time required for oxidation.
- (6) The reasons for souring with acid.
- (7) The reasons for washing and the processes after which it should be used.

B. Finishing.**1. The starch room.****(a) The water mangle.**

- (1) The conditioning of the cloth.
- (2) The straightening of the cloth.

(b) The pure-starch mangle.

- (1) The chemicals used.
- (2) The drying of the cloth.
- (3) The finishing of the cloth.

(c) The back-filling mangle.

- (1) The number of times the cloth should be run through the water mangle.
- (2) The amount of dryness necessary.
- (3) The purpose of the Tommy Dodds.
- (4) The chemicals used in the Tommy Dodds.
- (5) The binders used.
- (6) The final degree of dryness necessary.

2. The calender room.**(a) The finish produced by the calender machine.**

- (1) The 3-roll.
- (2) The 5-roll.
- (3) The 6-roll.
- (4) The friction calender.
- (5) The hydraulic calender.

(b) The purpose of the tenter frame.**3. The packing room.****(a) The purpose of the folder.****(b) The rough inspection of the cloth.****(c) The folding by hand to converter's lengths.****(d) The stamping and ticketing of the cloth.****(e) The types of packages used.****(f) The form in which the goods are shipped or stored.****(g) The reasons for the final weighing and checking.**

TEXTILE UNIT 34.—HUMIDITY IN THE COTTON MILL.

3 LESSONS.

- (a) The necessity of artificial humidity.
- (b) The appearance of yarn spun without humidity.
- (c) The appearance of yarn spun with humidity.
- (d) The reasons different rooms need different per cents of humidity.
- (e) The grains of water per cubic foot of air that give the best results.
- (f) The ratio between temperature and the amount of water the air will support.
- (g) Four methods of supplying humidity.
 - (1) High pressure through small apertures in pipes.
 - (2) Humidifiers, air artificially charged with vapor.
 - (3) Hydraulic, finely pulverized water discharged directly into the air.
 - (4) The old-fashion way, watering the floor.
- (h) The reason artificial humidity makes a mill cooler in summer and warmer in winter.
- (i) The hygrometer.
- (j) The hygrometer tables.

NOTE.—One lesson should be reading the hygrometers in the different rooms and the recording of the humidity.

PART IV.

ANALYSIS OF TEXTILE OCCUPATIONS AS BASIS OF RECOMMENDING COURSES OF INSTRUCTION FOR EVENING AND PART-TIME CLASSES.

**Part IV.—ANALYSIS OF TEXTILE OCCUPATIONS AS BASIS OF
RECOMMENDING COURSES OF INSTRUCTION FOR EVENING
AND PART-TIME CLASSES.**

1. TYPICAL MILL ORGANIZATION IN THE SOUTH.

The following organization as taken from the pay rolls of a representative southern mill may be considered typical of cotton mills in this section. The figures indicate the average number of workers of each kind in a typical plant of 1,000 employees.

ORGANIZATION.

General.

Superintendent.....	1	Assistant superintendent.....	1
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Picker room.

Section men.....	3	Finisher tenders.....	3
Opener tenders.....	3	Waste machine operators.....	2
Intermediate tenders.....	11		

Card room.

Overseer.....	1	Card strippers.....	10
Second hands.....	3	Card hands.....	14
Section men.....	6	Drawing hands.....	16
Oilers.....	3	Slubber tenders.....	11
Scrubbers.....	3	Intermediate tenders.....	14
Sweepers.....	3	Speeder tenders.....	42
Roving men.....	6	Roving testers.....	8
Lap men.....	2	Overhauling.....	2
Card grinders.....	6		

Spinning room.

Overseer.....	1	Filling men.....	5
Second hands.....	3	Warp spinners.....	63
Section men.....	13	Filling spinners.....	48
Oilers.....	10	Doffers.....	60
Roving men.....	10	Yarn checkers.....	2
Elevator men.....	5	Cleaning quills.....	13
Sweepers.....	23	Overhauling.....	3
Scrubbers.....	5	Spare hands.....	12

Spooler room.

Spooler men.....	3	Spooler tenders.....	56
Sweepers.....	2	Warper tenders.....	6
Beam men.....	2	Tying-in hands or creelers.....	13
Yarn men.....	5		

Slasher drawing-in machine room.

Slasher tenders.....	14	Tying-in machine helpers.....	3
Drawing-in machine tenders.....	2	Warp men.....	3
Drawing-in machine helpers.....	2	Harness men.....	8
Tying-in machine tenders.....	3		

Weave room.

Overseers.....	2	Oilers.....	17
Second hands.....	4	Smash hands.....	14
Section men.....	36	Quill men.....	10
Overhaulers.....	4	Sweepers.....	8
Changing-over men.....	9	Scrubbers.....	8
Cloth checkers.....	4	Piece weavers.....	114
Cloth truckers.....	5	Spare weavers.....	50
Filling men.....	11		

Cloth room.

Overseer.....	1	Hand inspectors.....	5
Second hands.....	2	Truckers.....	3
Checkers.....	2	Machine inspectors.....	19
Folder hands.....	3	Elevator men.....	2
Brushers and stitchers.....	6	Scrubber.....	1
Balers.....	7	Sweeper.....	1

Miscellaneous.

Machine shop, engine, and boiler room men.....	26	Yard men.....	56
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These positions are analyzed individually in Part IV, 3, and the courses as suggested in another part of this bulletin fitted to them. In the section following will be found in chart form these jobs in their relation to the entrance place and promotions in the mill.

2. PROMOTION DIAGRAM.

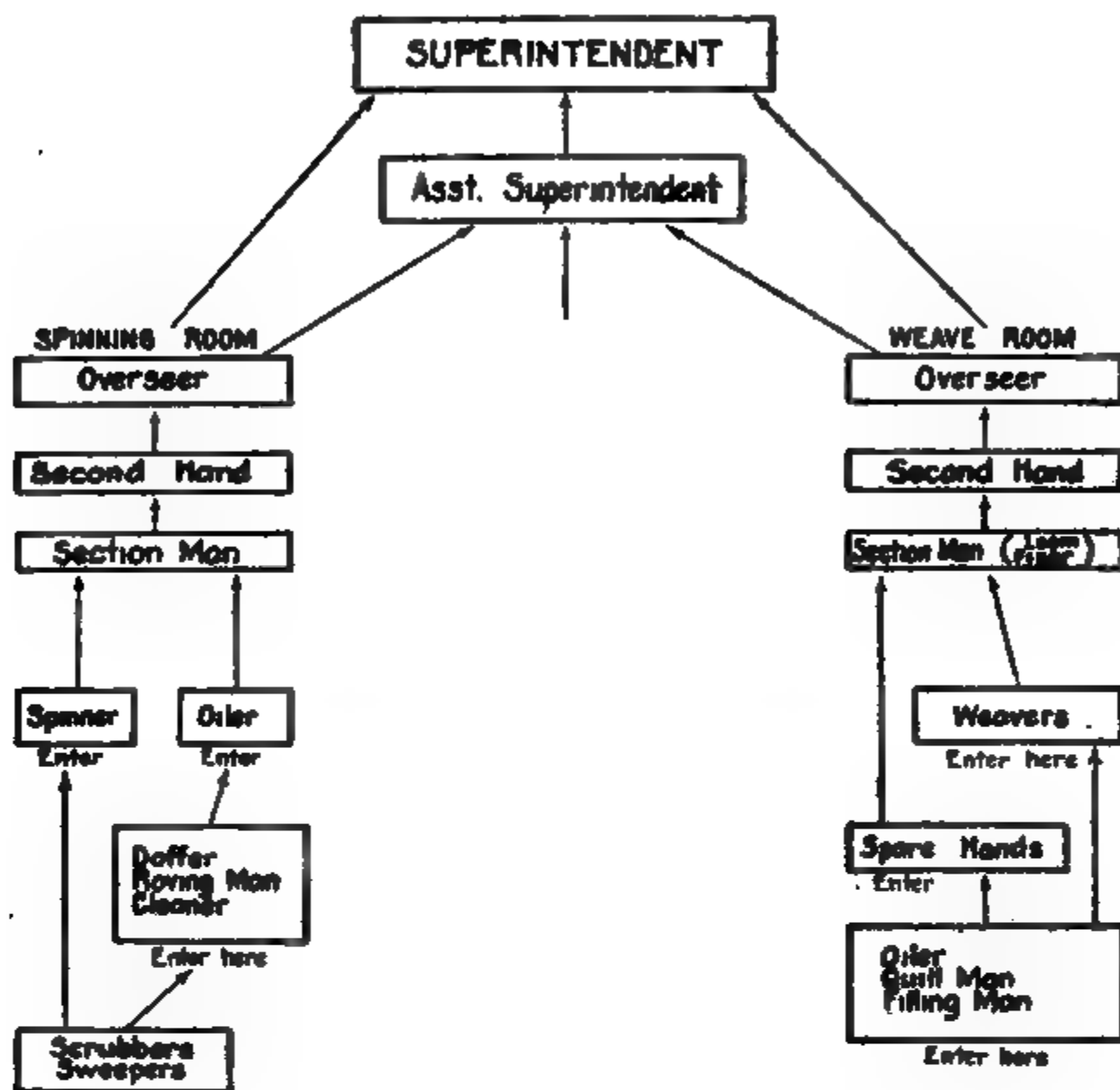


Diagram showing the usual places of entrance and the regular lines of promotion in the three main divisions of the mill. Transfer from one department to another is unusual, and the promotions are consequently within the same rooms.

3. ANALYSIS OF INDIVIDUAL JOBS.

In naming courses for the individual workers the recommendations are limited to these two considerations: (1) Courses which will fit the worker for better performing the immediate work at which he is engaged, (2) courses which are desired or needed for promoting him to the next higher job. Thus the recommended courses are not cumulative, and the recommendations represent the minimum.

In general, any of the courses outlined which are thought to be desirable or beneficial by the textile operative should not be denied him if, in the opinion of the instructor, he is capable of pursuing the work.

BALER (CLOTH ROOM).

Duties—The baler prepares the finished cloth for shipment. He cuts the burlap, paper, and bands; compresses the cloth in the press; sews the burlap and fastens the bands around the bale of gray cloth.

Promotion.—He may in some cases be promoted to second hand of cloth room.

Instruction.—Unit courses recommended, 1, 15, 23, and 25.

BEAM MAN (WARPER ROOM).

Duties.—The beam man removes the full beams from the warper and replaces them with empty beams. He trucks the full beams to the slasher.

Promotion.—He is promoted to spooler man.

Instruction.—Unit courses recommended, 1, 9, 10, 15, and 25.

BRUSHER TENDER (CLOTH ROOM).

Duties.—This man operates the brushing machine. He starts the cloth into the machine and must always be on the alert while the cloth is passing through.

Promotion.—He is promoted to baler, or second hand.

Instruction.—Unit courses recommended, 1, 15, 23, and 25.

CARD HAND (CARD ROOM).

Duties.—The card hand places the full lap in the cards, doffs the full cans of sliver, cleans and oils the cards, and removes the fly from underneath the cards in his section.

Promotion.—He is usually promoted to card grinder.

Instruction.—Unit courses recommended, 1, 4, and 15.

CARD GRINDER (CARD ROOM).

Duties.—The card grinder sharpens the card clothing on the cylinder, doffer, and flats, makes the necessary changes in stock and gearing, looks after the card strippers, lap man, and card hands.

Promotion.—His line of promotion is to second hand or overseer.

Instruction.—Unit courses recommended, 1, 2, 3, 4, 5, 6, 7, 15, 16, 25, 31, and 34.

CARD STRIPPERS (CARD ROOM).

Duties.—The card strippers remove the flat waste, strip the cylinders and doffers, piece up the ends after stripping, help to brush down the pulleys, hangers, and ceiling over the cards.

Promotion.—The usual line of promotion is to card grinder.

Instruction.—Unit courses recommended, 1, 4, and 15.

CHECKER (CLOTH ROOM).

Duties.—The checker records all the particulars in regard to the cloth—first, as it comes from the weave room; second, as it is inspected; third, its final classification.

Promotion.—The checker is usually promoted to second hand.

Instruction.—Unit courses recommended, 1, 15, 18, 20, 21, 23, and 25.

CLOTH CHECKER (WEAVE ROOM).

Duties.—The cloth checker puts an identification tag on the full roll of cloth as it is taken from each loom. This tag credits the loom and weaver with a certain amount of cloth. The cloth checker also credits the loom and weaver with the cloth on the cut board, and weave room pay roll.

Promotion.—When the cloth checker is promoted it is generally to a position in the mill office.

Instruction.—Unit courses recommended, 1, 15, 18, 23, 25, and 26.

CLOTH TRUCKER (WEAVE ROOM).

Duties.—The cloth trucker works with the cloth checker. After the checker tags the cloth the trucker follows and places the tagged cloth on the cloth truck. When the cloth truck is filled he pushes it to the cloth room.

Promotion.—His daily work naturally puts him in a position to become cloth checker. This is not, however, a usual line of promotion, as the prerequisite of a trucker is merely physical strength. Some education is necessary to become a checker.

Instruction.—Unit courses recommended, 1, 15, and 25.

COMBER FIXER OR COMBER BOSS (CARD ROOM).

Duties.—The comber fixer repairs the sliver lap, ribbon lap, and combers. It is also his duty to see that the machines are properly oiled, cleaned, and operated.

Promotion.—He is usually promoted to second hand, or overseer.

Instruction.—Unit courses recommended, 1, 2, 3, 4, 5, 6, 7, 15, 16, 25, 31, and 34.

COMBER TENDER (CARD ROOM).

Duties.—The comber tender cleans the comber several times a day, oils the front of the machine, pieces up all ends that break, places full laps on the lap rolls, and doffs the full cans of combed sliver.

Promotion.—Comber tenders are promoted to comber fixers.

Instruction.—Unit courses recommended, 1, 2, 5, and 15.

CREELERS OR WARPER TYING-IN HANDS (WARPER ROOM).

Duties.—The duty of the creeler is to remove the empty spools from the warper creel, replacing them with full spools, tying the end from the full spool to the end in the warper.

Promotion.—Creelers are promoted to warper tenders.

Instruction.—Unit courses recommended, 1, 10, and 15.

DOFFERS (SPINNING ROOM).

Duties.—The doffers stop the frames at the proper time, replace the full bobbins with empty bobbins, wind the builder motion back, start up the frame and piece up the ends that are down.

Promotion.—Doffers are promoted to oiler, or section man.

Instruction.—Unit courses recommended, 1, 8, 15, and 19.

DRAWING HAND (CARD ROOM).

Duties.—The drawing hand dumps the cans at the back of the drawing frame, pieces up the broken ends, both front and back, doffs the full cans, oils the drawing rolls, and keeps the machines clean.

Promotion.—Drawing hands may be promoted to speeder tender.

Instruction.—Unit courses recommended, 1, 6, 7, and 15.

ELEVATOR MAN.

Duties.—The elevator man operates the elevator between the floors of the mill.

Instruction.—Inasmuch as he is not directly connected with production, the unit courses for any department should be open to him.

FILLING MAN OR FILLING CARRIER (WEAVE ROOM).

Duties.—The duty of the filling man is to place the full bobbins of filling yarn in the filling boxes at the looms. The only skill required is that of keeping the counts of the filling separate and placing them in their correct boxes.

Promotion.—He may be promoted to loom fixer.

Instruction.—Unit courses recommended, 1, 15, 20, 21, and 22.

FOLDER MAN (CLOTH ROOM).

Duties.—The folder man operates the folding machine; this machine folds the long cuts of woven cloth into the length desired, usually 1 yard.

Promotion.—He may be promoted to baler, or second hand of cloth room.

Instruction.—Unit courses recommended, 1, 15, 23, and 25.

HAND INSPECTOR (CLOTH ROOM).

Duties.—After the cloth leaves the folder the hand inspector completes the work done by the machine inspectors. He examines all the imperfections as marked by the machine inspectors, and grades the cloth as one of four classes.

Promotion.—He may be promoted to second hand of cloth room.

Instruction.—Unit courses recommended, 1, 15, 23, and 25.

HARNESS MAN (SLASHER ROOM).

Duties.—When a pattern or warp turns out on a loom the harnesses and drop wires are returned to the harness man, who cleans and files them in the harness stock room.

Promotion.—He may be promoted to helper on drawing in machines.

Instruction.—Unit courses recommended, 1, 11, 15, 20, and 25.

HELPER ON DRAWING-IN MACHINE (SLASHER ROOM).

Duties.—The loom beams are too heavy for one man to handle, therefore the machine operator has to have a helper. This helper assists in placing the loom beams, drop wires, and harnesses in the drawing-in machines.

Promotion.—He is promoted to warp drawing-in machine tender.

Instruction.—Unit courses recommended, 1, 11, 15, 18, 20, 25, 31, and 34.

INTERMEDIATE TENDER, SPEEDER TENDER, AND JACK FRAME TENDER (CARD ROOM).

Duties.—The work of these operatives is the same. They creel, doff, and piece up broken ends, oil and clean the drawing rolls, clean their machines, and sweep the alley between the machines.

Promotion.—They are promoted to speeder fixers.

Instruction.—Unit courses recommended, 1, 7, and 15.

LAP MAN (CARD ROOM).

Duties.—The picker laps are taken from the picker room to the cards by the lap man. He assists the strippers in brushing down the ceiling, pulleys, and hangers over the cards.

Promotion.—The lap man is generally promoted to card stripper or card hand, and sometimes to grinder.

Instruction.—Unit courses recommended, 1, 4, and 15.

LOOM FIXER (WEAVE ROOM.)

Other names: "Change-over," when he has very little experience. "Overhauler," when he is an expert fixer.

Duties.—The fixer's main duty is to keep the looms repaired and in good running order. Removes the empty beams, replaces them

with full beams, and weaves a few inches of the new yarn into the cloth to see that the pattern is weaving perfectly. He has charge of 60 to 120 looms.

Promotion.—The loom fixer is promoted to second hand or overseer of weaving.

Instruction.—Unit courses recommended, 1, 15, 18, 20, 22, 25, 31, and 34.

MACHINE INSPECTOR (CLOTH ROOM).

Duties.—The machine inspector gives the cloth a hasty inspection as it runs through the inspecting and trimming machine.

Promotion.—This inspector corrects as many imperfections as possible; marks those that can not be corrected in such a manner that the attention of the hand inspector is attracted when the cloth reaches him. This work is generally done by girls or women, which makes promotion to hand inspector or second hand unusual.

Instruction.—Unit courses recommended, 1, 15, 23, and 25.

OILER (CARD ROOM, SPINNING ROOM, AND WEAVE ROOM).

Duties.—Oilers are employed in each room, sometimes on each section, to oil the frames according to a system laid out by the overseer of that room. They generally assist in brushing down the ceiling, pulleys, and hangers.

Promotion.—They are promoted to fixer on the section that they oil.

Instruction.—Unit courses recommended for the oiler on each section are:

Card oiler, 1, 4, 6, 15, and 16.

Comber oiler, 1, 5, 6, 15, and 16.

Roving frames, 1, 7, 15, and 16.

Spinning frames, 1, 8, 15, 17, and 19.

Weave room, 1, 15, 18, 20, 21, and 22.

OVERHAULER (ALL ROOMS).

Duties.—The overhauler on each section is an expert fixer on that particular type of machine.

Promotion.—He is usually promoted in each room to second hand or overseer.

Instruction.—Unit courses recommended for the overhauler in each room are:

Card room, 1, 2, 3, 4, 5, 6, 7, 15, 16, 25, 26, 31, and 34

Spinning room, 1, 2, 8, 14, 15, 17, 19, 25, 26, 31, and 34.

Warp preparation, 1, 2, 9, 10, 11, 12, 13, 15, 18, 25, 26, 31, and 34.

Weave room, 1, 2, 15, 18, 20, 21, 22, 25, 26, 31, and 34

OVERSEER (CARD ROOM, SPINNING ROOM, AND WEAVE ROOM).

Duties.—The overseer in each room is responsible for that room. The quantity and quality of the work, the help, and the records or pay roll are under his direct supervision.

Promotion.—His line of promotion is to superintendent.

Instruction.—Unit courses recommended for the overseer are:

Card room, 1, 2, 9, 10, 11, 12, 13, 14, 15, 17, 18, 20, 21, 22, 23, 24, 26, 31, and 34.

Spinning room, 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 15, 16, 19, 20, 21, 22, 23, 24, 26, 31, and 34.

Slasher, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 31, and 34.

Weave room, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 23, 24, 26, 31, and 34.

OVERSEER CLOTH ROOM.

Duties.—The overseer has supervision over the grading, inspecting, folding, and packing of the gray cloth into bales or bundles.

The records and reports on the cloth and help are also under his direct supervision.

Promotion.—He may be promoted to overseer of weaving

Instruction.—Unit courses recommended 1, 15, 18, 20, 21, 22, 25, 26, 31, and 34.

PICKER TENDER (CARD ROOM).

Duties.—The duties of the picker tender are to clean and oil the pickers, feed the cotton, doff the laps when full, and assist the section man when necessary.

Promotion.—He may be promoted to section man on pickers.

Instruction.—Unit courses recommended, 1, 3, 15, and 16.

QUILL BOY (SPINNING ROOM).

Duties.—This work is usually done by boys or old men and consists of placing the filling bobbins, as they come from the loom, in the quill-cleaning machine.

Promotion.—The line of promotion is to a doffing job.

Instruction.—Unit courses recommended, 1, 8, 15, 17, and 19.

QUILL MAN (WEAVE ROOM).

Duties.—This is one of the simplest jobs in the mill. The quill man removes the used filling bobbins from the loom boxes and trucks them to the elevator and spinning room.

Promotion.—He is promoted to filling man.

Instruction.—Unit courses recommended, 1, 15, and 21.

ROVING MAN (CARD ROOM AND SPINNING ROOM).

Duties.—The work of the roving man is removing the full bobbins of roving from the truck and placing them on the creel of the next process.

Promotion.—Roving men are employed in the card room and spinning room and are usually promoted to oiler or section men.

Instruction.—Unit courses recommended:

Card room, 1, 7, and 15.

Spinning room, 1, 8, 15, and 19.

ROVING TESTER (CARD ROOM).

Duties.—The roving tester weighs and makes a record of the weight of the product from each machine, two, three, or four times each day.

Promotion.—He is usually promoted to a fixing, or second-hand job.

Instruction.—Unit courses recommended, 1, 2, 3, 4, 5, 6, 7, 15, 16, 25, 31, and 34.

SCRUBBER (ALL ROOMS).

Duties.—The floor of each room is washed by the scrubber about once a week.

Promotion.—The scrubber has auxiliary work and is not connected with promotion. In addition to courses No. 1 and No. 15, he should be encouraged to take a line of study which will elevate him to a position as machine operator in the room in which he works.

SECOND HAND (CARD ROOM, SPINNING, WEAVE, AND CLOTH ROOMS).

Duties.—The second hand is the assistant to the overseer in each room, and his duty is to relieve the overseer of as much of the detail as possible in keeping the work supervised, production maintained, and records made.

Promotion.—He is promoted in each room to overseer.

Instruction.—Unit courses recommended:

Card room, 1, 2, 3, 4, 5, 6, 7, 15, 16, 25, 26, 31, and 34.

Spinning room, 1, 2, 8, 14, 15, 17, 19, 25, 26, 31, and 34.

Weave room, 1, 2, 15, 18, 20, 21, 22, 23, 25, 26, 31, and 34.

Cloth room, 1, 15, 18, 20, 21, 22, 25, 31, and 34.

SECTION MAN OR PICKER BOSS (CARD ROOM).

Duties.—The section man has charge of the picker and opening rooms. He directs the work of the picker tenders, repairs the machines, and makes necessary changes in stock and gearing.

Promotion.—He may be promoted to card grinder or second hand.

Instruction.—Unit courses recommended, 1, 2, 4, 5, 6, 7, 15, 16, 25, 31, and 34.

SECTION MAN OR SPEEDER FIXER (CARD ROOM).

Duties.—The speeder fixer, as his name implies, fixes the speeders or roving frames when they break. Whenever a change in stock or gearing is necessary he makes this change under the orders of the overseer. It is the fixer's duty to see that the speeder tenders keep their machines cleaned, oiled, and running, and that the roving men and oiler keep up with their work.

Promotion.—The fixer is usually promoted to second hand or overseer of the card room.

Instruction.—Unit courses recommended, 1, 2, 3, 4, 5, 6, 15, 16, 25, 31, and 34.

SECTION MAN ON SPINNING (SPINNING ROOM).

Duties.—The section man has charge of a number of frames, the operative required to run the frames, and the quantity and quality of the work turned off. He carries out the orders of the overseer as delivered by the second hand.

Promotion.—His promotion is to second hand.

Instruction.—Unit courses recommended, 1, 2, 8, 15, 17, 19, 25, 31, and 34.

SEWING AND ROLLING MACHINE TENDER (CLOTH ROOM).

Duties.—This job, as the name implies, consists of sewing the ends of the cuts of the cloth together and then rolling them by machinery to the required size.

Promotion.—The line of promotion is to cloth checker.

Instruction.—Unit courses recommended, 1, 15, 23, and 25.

SLASHER TENDER.

Duties.—The slasher tender operates the slasher, mixes the sizing materials, controls their cooking and the speed with which the yarn absorbs them. He must watch the temperature of the size mixture, both in the kettle and size box, the steam pressure in the cylinders, and the degree of dryness of the yarn as it goes on to the loom beam.

Promotion.—He is in line for promotion to overseer of slashing.

Instruction.—Unit courses recommended, 1, 10, 11, 15, 18, 20, and 21.

SLIVER LAP TENDER AND RIBBON LAP TENDER (CARD ROOM).

Duties.—These jobs are the same. The tender pieces up all broken ends, both front and back, doffs the full laps, cleans and oils the machines, and in some cases distributes the laps on the comber creels.

Promotion.—They may be promoted to comber tender or comber fixer.

Instruction.—Unit courses recommended, 1, 2, 5, and 15.

SLUBBER TENDER (CARD ROOM).

Duties.—The slubber tender dumps the cans at the back of the slubber, pieces up broken ends, doffs the frame when the bobbins are full, oils and cleans the drawing rolls, cleans the slubber and sweeps his front alley.

Promotion.—Slubber tenders are promoted to section men.

Instruction.—Unit courses recommended, 1, 7, and 15.

SMASH HANDS (WEAVE ROOM).

Duties.—The smash hand is an expert weaver, and fixes smashes that are too big for the weaver to fix without having all the other looms in the set stopped. The smash hand teaches beginners in weaving, and has no particular set of looms, but goes about the room wherever needed.

Promotion.—Smash hands are promoted to loom fixers.

Instruction.—Unit courses recommended, 1, 15, 18, 20, 21, and 22.

SPINNER (SPINNING ROOM).

Duties.—The spinners piece up the ends, creel the back roving; clean the finger board, the creel, the ring, and bolster rails.

Promotion.—When they are promoted it is to a fixers job.

Instruction.—Unit courses recommended, 1, 8, 15, 17, and 19.

SPOOLER MAN (SPOOL ROOM).

Duties.—The spooler has charge of the spoolers and warpers and the hands necessary to operate the machines. He also records the kind and amount of work done by each machine and operator in making out the pay roll.

Instruction.—Unit courses recommended, 1, 9, 15, 25, 31, and 34.

SPOOLER TENDERS (SPOOL ROOM).

Duties.—The spooler tenders piece up the warp bobbin end, and the end on the spool by the aid of the automatic knotter.

Instruction.—Unit courses recommended, 1, 9, and 15.

SWEEPER.

Duties.—The spare floor and main alleys in each room are kept clean of lint and loose cotton by the sweeper.

Instruction.—Any unit courses by which he can profit should be open to him.

WARP DRAWING-IN MACHINE TENDER—WARP TYING-IN MACHINE TENDER.

Duties.—This man operates either the drawing-in machine or the tying-in machine. He arranges the loom beam, as it comes from the slasher, in the proper relation to the harnesses so that the ends can be drawn in or tied in. When all the ends on one beam have been drawn in or tied in he removes the loom beam, drop wires and harnesses as one piece. He should be a mechanic, as the adjustments necessary are very delicate and must be accurate.

Promotion.—His usual line of promotion is to overseer of slashing and drawing in.

Instruction.—Unit courses recommended, 1, 11, 15, 18, 20, 21, 25, 31, and 34.

WARPER TENDERS (SPOOLER ROOM).

Duties.—The warper tenders start the empty beams, and piece up any ends that come down while the beams are filling.

Instruction.—Unit courses recommended, 1, 10, and 15.

WASTE MACHINE OPERATOR (CARD ROOM).

Duties.—The operator cleans and oils the waste machine, feeds the soft waste to the machine, cleans the tail ends of roving from the bobbins, and collects the soft waste in the mill.

Instruction.—Unit courses recommended, 1, 2, 3, and 15.

WEAVER (WEAVE ROOM).

Duties.—The duty of the weaver is to operate a set or number of looms, keeping all warp ends pieced up and the loom shuttles supplied with filling. The weaver must know when the cloth is not weaving properly, also be able to piece out or scratch out small imperfections with the weavers' comb.

Promotion.—A weaver is usually promoted to loom fixer.

Instruction.—Unit courses recommended, 1, 15, 20, 21, and 22.

YARN MEN (SPOOLER ROOM).

Duties.—The yarn men do the heavy work in the spooler room, such as dumping boxes of bobbins, and trucking the full spools to the warps.

Promotion.—They may be promoted to spooler men.

Instruction.—Unit courses recommended, 1, 9, 10, 15, 25, 31, and 34.

4. RUNNING ANALYSIS OF MANUFACTURING PROCESSES.

The processes of cotton manufacturing described for the purpose of relating the courses of instruction to the work of the operatives.

Description of processes.	Worker.	Product.	Unit courses recommended.
<p>PICKING AND CARDING.</p> <p>The cotton is received at the mill warehouse in the form of a bale 27 by 54 by 54 inches covered with burlap and fastened with six ties or hoops of iron. Two tags made out for each bale, one is attached to the bale and the other is taken to the mill office and placed on file. From these tags a selection is made that conforms to the grade of work being done at the mill at that time. The bales are now taken to the mixing or opening room and placed in a semicircle around the bale breaker. The ties are cut and the burlap removed. If, on opening, any of the bales are not up to the standard required, they are set aside and others brought to take their places.</p> <p>The worker takes a layer from each of the assembled bales in turn, lays it on the feed apron which carries it against the spiked lifting lattice which in turn carries it up and over. If the lump of cotton is too large the spiked evenner roll knocks it down on the feed apron and the process is repeated until the lump is small enough to go over the top, where it is removed from the lifting lattice by the doffing beater, passed to the pneumatic conveyor, through the cleaning trunks, and through the condenser to the gauge box.</p> <p>A traveling apron in this box carries it forward to the feed rolls; a revolving beater strikes the cotton, loosening the heavier trash and detaching some of the cotton, carries it over the grid bars, through which the heavier impurities drop, while the bulk of cotton is passed forward, and, assisted by the action of the air current, is laid on the cages. The cotton is slightly felted as it is passed between the cages, around the calendar rolls, and on to the lap rolls, where it is wound around the lap rod by friction and into a breaker picker lap.</p> <p>The laps from the breaker picker are very uneven in thickness, therefore, four of these laps are doubled at the back of the intermediate on the traveling feed lattice, which feed them through the evenner motion, where the unevenness is taken care of to a certain extent before the cotton passes to the feed rolls. While the cotton is held by the feed rolls the blade beater strikes the cotton, loosening the heavier impurities, which fall through the grid bars as the cotton is passed over them to the cages, around the calendar rolls to the lap rolls, where it is wound into an intermediate lap.</p> <p>To insure further uniformity of lap this process is repeated at the finisher.</p> <p>The work of the preceding processes is under the supervision of the picker boss, or section man, who directs the work of the picker tenders, repairs the machines, and makes necessary changes in stock or gearing.</p> <p>An operative places the finisher picker laps on a lap truck and transports them to the card room, where he places them on the lap stands of the card.</p> <p>A lap from the finisher picker is placed on the lap roll of the card, and is unwound by friction, the cotton then passes between the feed plate and the feed roll. As</p>	<p>Bale breaker tender.</p> <p>Picker tender....</p> <p>Picker tender.....</p> <p>Picker tender.....</p> <p>Picker tender.....</p> <p>Picker boss or section man.</p> <p>Lap man.....</p> <p>Card hands.....</p>	<p>Mixing.....</p> <p>Breaker picker lap.</p> <p>Intermediate picker lap.</p> <p>Finisher picker lap.</p> <p>.....</p> <p>Finisher picker lap.</p> <p>Carded sliver.....</p>	<p>Nos. 1, 3, 15.</p> <p>Nos. 1, 3, 15.</p> <p>Nos. 1, 3, 15.</p> <p>Nos. 1, 3, 15.</p> <p>Nos. 1, 3, 15.</p> <p>Nos. 1, 2, 4, 5, 6, 7, 15, 16, 25, 34, 31.</p> <p>Nos. 1, 3, 15.</p> <p>Nos. 1, 4, 15.</p>

The processes of cotton manufacturing described for the purpose of relating the courses of instruction to the work of the operatives—Continued.

Description of processes.	Worker.	Product.	Unit courses recommended.
PICKING AND CARDING—continued.			
the cotton leaves the feed roll the licker-in presses it against the feed-plate nose and passes through the fringe, combing it, loosening the impurities which are stripped from the licker-in by the mote knives. The bulk of the cotton is carried on, and the cylinder lifts it from the licker-in by its higher surface speed. The cylinder clothing holds one end of the fiber while the other end is drawn through the wire of the flats, where the impurities remain together with a small amount of the cotton, after which the cylinder lays the carded cotton on the doffer. The cotton is removed from the doffer by the doffer comb in the form of a web, condensed by being drawn through a trumpet by a pair of calendar rolls, passed to the top of the coiler, again condensed and finally passed through the tube gear which coils the carded cotton in the form of a sliver in the card can.			
In order that the cards may do their best work, an operative has to keep the wire clothing on the flats, cylinder, and doffer sharp and in good condition by grinding with grinding rolls covered with emery. The flats are automatically stripped of the waste. The cylinder and doffer become loaded with waste, short cotton, and impurities, which have to be removed by the workers, who use a special brush for this purpose, called a stripping brush.	Card grinder.....		Nos. 1, 2, 3, 5, 6, 7, 15, 16, 25, 34, 31.
Sixteen to 24 ends of the carded sliver are now doubled at the back of the sliver lap machine, drawn through the stop motion, drawing rolls, condensed by the calendar rolls into a thin web and wound on to a wooden spool by friction. A worker doffs the full lap.	Card strippers.....		Nos. 1, 4, 15.
Four or 6 of these sliver lap spools are placed at the back of the ribbon lap, drawn off the stop motion, through the drawing rolls, over the quarter turn plates, doubled on the table, condensed into a thin web by the calendar rolls, and wound on to a wooden spool by friction. The full spools are removed by the worker, who also pieces up the lap at the back when they break or run out.	Lapper tender.....	Sliver lap.....	Nos. 1, 5, 15.
Six or 8 laps from the ribbon lap machine are placed on the lap rolls at the back of the comber and unwound by friction. The cotton is guided by the lap aprons to the feed rolls which pass it to the nipper frames. The nipper frames hold the sheet of fibers while the half lap passes through the cotton, straightening the fibers and removing the short staple and some of the impurities, after which the nipper frame releases the cotton. The segment and detaching rolls remove the combed fibers, when the nipper knife opens, and pass the web into the sliver pan. The web of cotton is condensed into a sliver as it is drawn through the sliver pan trumpet by the table calendar rolls. The ends from each pan are passed around a guide on the sliver table and drawn to the draw box by the back drawing roll. At the draw box the ends are doubled, and in passing through the rolls are drawn about five and one-half times their length on the table. The cotton is again condensed by being drawn through the draw box trumpet by the draw box calendar rolls, after which it is passed up	Lapper tender.....	Ribbon lap.....	Nos. 1, 5, 15.
	Comber tender....	Combed sliver.....	Nos. 1, 5, 15.

The processes of cotton manufacturing described for the purpose of relating the courses of instruction to the work of the operatives—Continued.

Description of processes.	Worker.	Product.	Unit courses recommended.
<p>PICKING AND CARDING—continued.</p> <p>and over a guide to the coiler trumpet, condensed by being drawn through the trumpet by the coiler calender rolls. It then falls through the offset-tube gear, which coils the combed sliver in the can. When the cans become full they are removed by an operative.</p> <p>A worker is assigned to repair and keep the sliver lap, ribbon lap, and combers in the best possible condition. He also changes the gears and stock when necessary.</p> <p>Five, 6, or 8 ends of carded or combed sliver are passed through the finger guides and the stop motion, are doubled and drawn in the drawing rolls to a thin web, condensed by being drawn through a trumpet by the calendar rolls directly over the tube gear, which coils the breaker drawing sliver in the can.</p> <p>An intermediate machine is often used which repeats the preceding operation to improve the uniformity of the sliver. When necessary the operation is again repeated for the same purpose in the finisher drawing frame.</p> <p>An operative pieces up the broken ends and doffs the full cans. Each end of the drawing sliver is passed through the slubber separately. The end is lifted out of the can by the lifting roll, is drawn through the roving traverse motion to the drawing rolls, where it is drawn from three to five times its original length. After the cotton issues from the drawing rolls it is too weak to be handled, therefore, a slight amount of twist is inserted by threading the end through the flyer, which, as it revolves inserts the twist. The slubber roving is guided onto the bobbin by the flyer, but the winding is done by the bobbin, which has a slightly higher surface speed than the flyer, at this point of contact. When the bobbins become full they are doffed onto a truck by the worker, and pushed onto the spare floor.</p> <p>A worker distributes the trucks of bobbins around the room on the intermediate creels.</p> <p>Sharp-pointed wooden skewers are placed in the slubber bobbins, then bobbin and skewer are placed in the creel of the intermediate. The skewer rests upon a porcelain step to facilitate the unwinding of the slubber roving from the bobbin with the least possible strain. The ends of slubber roving are drawn through the eye of the roving traverse motion, after which the cotton is processed the same as at the slubber.</p> <p>When making coarse yarn, the roving goes from the intermediate direct to the spinning. For medium yarn the intermediate process is repeated on a finer frame called a roving or fine frame, after which the roving is taken to the spinning frame.</p> <p>For fine yarns the roving, or fine frame process, is repeated on a finer frame called a jack frame, after which the roving goes to the spinning frame.</p> <p>A special worker has charge of the roving frames, and makes the necessary changes in stock and gearing when so ordered by the chief worker, the overseer, or his assistant, the second hand.</p>			
	Comber fixer.....	.....	Nos. 1, 2, 3, 4, 6, 7, 15, 16, 25, 34, 31.
	Breaker drawing frame sliver.	.	
	.....	Intermediate draw frame sliver.	
	Draw frame tender	Finisher, draw frame sliver.	Nos. 1, 6, 15.
	Slubber tender....	Slubber roving....	Nos. 1, 7, 15.
	Roving man.....	.....	Nos. 1, 7, 15.
	Intermediate tender.	Intermediate roving.	Nos. 1, 7, 15.
	Speeder tender....	Fine roving.....	Nos. 1, 7, 15.
	Jack frame tender.	Jack roving.....	Nos. 1, 7, 15.
	Speeder fixer.....	Roving.....	Nos. 1, 2, 3, 4, 5, 6, 15, 16, 25, 34, 31.
	Overseer of card room, second hand in card room.	.....	Nos. 1, 2, 9, 10, 11, 12, 13, 14, 15, 17, 18, 20, 21, 22, 23, 24, 26, 31, 34. Nos. 1, 2, 3, 4, 5, 6, 7, 15, 16, 25, 26, 31, 34.

The processes of cotton manufacturing described for the purpose of relating the courses of instruction to the work of the operatives—Continued.

Description of processes.	Worker.	Product.	Unit courses recommended.
PICKING AND CARDING—continued.			
A worker oils the fast running parts of the roving frames twice a day, the shafting once a week and helps with the brushing down.	Oiler.....		Nos. 1, 7, 15.
The dirty waste and fly must be kept off the floor to prevent its getting on the work. A worker assigned to this work sweeps the floor thoroughly a number of times a day.	Sweeper.....		Nos. 1, 15, 3, or 4.
Removing the loose cotton from the floor is not enough. A worker scrubs the floor to remove oil stains and all the dirt possible.	Scrubber.....		Nos. 1, 15, 3, or 4.
SPINNING.			
Sharp-pointed wooden skewers are placed in the bobbins of roving, then bobbin and skewer are placed in the creel of the spinning frame. The skewer, in each case, rests upon a porcelain step to facilitate the unwinding of the roving from the bobbin. Two ends of roving are drawn through one eye of the roving traverse motion, which guides the roving into the drawing rolls, where it is drawn from 8 to 12 times its length as roving. From the front roll the yarn passes down through the thread guide, is twisted and guided by the traveler onto the bobbin. When the bobbins are full, a set of workers doff them into yarn trucks.	Spinner.....	Yarn Warp and filling.	Nos. 1, 8, 15.
	Doffers.....	Bobbins of yarn..	Nos. 1, 8, 15.
The trucks containing filling yarn are transferred to the weave room.			
The warp yarn is transferred by a worker to the spare floor of the spooler room.	Yarn man.....		Nos. 1, 8, 15.
The spinning room is divided into sections, a special worker having direct charge of all workers in each particular section. The special worker makes the necessary changes in stock, gearing, and help when so directed by his chief, the overseer, or his assistant, the second hand.	Section man.....		N 25,
	Overseer.....		N , 6, 13, 20, 25,
A worker operates a machine, which cleans the tail ends of yarn from the filling bobbins in order that they may be used again.	Second hand.....		N 17,
The spinning frames need a more thorough overhauling, at stated intervals, than the section man has time or experience to give to them, therefore a special worker does this work.	Quill boy.....	Empty bobbins..	N
	Overhauler.....		N 17,
A worker dumps the warp yarn into the boxes on to the spooler. The bobbins of yarn are placed in the holders, automatically tied by the spooler tender and the automatic knoter to the tail end of yarn on the spool placed in the thread guide, which, due to its construction, is also a slub catcher, and wound on the spool. The full spools are placed in trucks and pushed to the spare floor at the warper creel.	Yarn man.....		No. 1, 9, 10, 15, 24, 31.
	Spooler tender....	Spool of yarn.....	Nos. 1, 9, 15.
A number of workers replace the empty spools in the V-shaped creel with full spools from the spooler. They tie the ends of yarn from the full spools to the ends of yarn attached to the beam.	Creeler.....		Nos. 1, 10, 15.
The warper is operated by another worker, who draws any ends that break from the creel through the rolls and stop motion to the slasher beam.	Warper tender....	Slasher beams.....	Nos. 1, 10, 15.
The full beams are removed from the machine by a different worker than the operator of the machine.	Beam man.....	Full slasher beams	Nos. 1, 9, 10, 15, 25.
The workers on the spoolers and warpers are under the supervision of a chief worker. It is his duty to record the work done on each machine by each worker.	Spooler man.....		Nos. 1, 11, 15, 18, 19, 25, 34, 31.

The processes of cotton manufacturing described for the purpose of relating the courses of instruction to the work of the operatives—Continued.

Description of processes.	Worker.	Product.	Unit courses recommended.
SPINNING—continued.			
<p>The slasher beams are now placed in the slasher creel. The yarn is sized by being immersed in a hot starchy solution, dried by passing around a steam-heated cylinder, and is wound on a loom beam. These operations are cared for by an attendant and his assistant. When the loom beam is filled it is doffed from the slasher and taken to the warp drawing-in room.</p> <p>A worker in the drawing-in room, or his assistant, obtains the harness necessary for that particular warp from the worker in the harness stock room. The warp and harnesses are placed in the warp drawing-in machine, where one or more threads are drawn through each heddle, or harness eye, according to the definite design or pattern required in the woven cloth.</p>	Helper on slasher..	Sized warp.....	Nos. 1, 11, 15, 13, 21.
	Slasher tender.....	.....	Nos. 1, 10, 11, 15, 13, 19, 20, 21.
	Warp drawing-in, or tying-in machine tender.	.....	Nos. 1, 10, 11, 15, 13, 20, 21, 22, 31, 34.
	Helper, drawing-in room.	.....	Nos. 1, 11, 15, 13, 21, 25, 34, 31.
	Harness man.....	Drawn-in warp...	Nos. 1, 11, 15, 20, 21.
WEAVE ROOM.			
<p>After the warp has been drawn through the harnesses and reed, it is transferred to the weave room, where a worker places the warp and harnesses in the loom, makes the necessary adjustments, and weaves the first few inches of cloth to be sure that the pattern is weaving correctly. Another worker continues the weaving after the loom has been started up, pieces up the broken ends, oils and cleans the machine until the warp runs out.</p> <p>The filling yarn runs out rapidly as it is supplied to the loom in small amounts. A worker distributes the full bobbins of filling to each loom box at regular intervals.</p> <p>After a certain number of yards are woven the roll of cloth is removed from the loom; tagged by a worker, with the number of the loom and the operative producing the cloth. A third worker places the rolls of cloth on a truck and transfers it to the cloth room.</p> <p>At certain intervals during the day the used filling bobbins are collected by a worker and returned to the spinning room.</p> <p>The work and workers in the weave room are under the supervision of an overseer, and his assistant, the second hand.</p> <p>When the woven cloth arrives in the cloth room, a worker records the particulars on the weave room cloth tag, and as the cloth passes through the different machines he makes additions and corrections to these items. This record must be accurate for the weaver's pay is based upon it.</p> <p>A number of cuts of cloth are sewed together and wound into a large roll by a rolling machine.</p> <p>A worker gives the cloth a hasty inspection, removes as many imperfections as possible, and marks the others in such a manner that they will be noticed when the cloth is inspected on the table.</p> <p>After the cloth has been over the inspecting machine, a worker passes it through a brushing machine, which removes loose threads and any fly that may be on the cloth.</p> <p>The cloth goes to the worker at the folding machine where it is folded into yard lengths.</p> <p>The cloth is now inspected by hand, and graded into one of four classes, after which a worker wraps and presses it into a bale.</p> <p>The cloth room is under the control and supervision of a chief worker and his assistant.</p>	Loom fixer.....	.....	Nos. 1, 15, 13, 20, 22, 25, 34, 31.
	Weaver.....	Cloth.....	Nos. 1, 15, 13, 20, 21, 22, 23.
	Filling carrier.....	.....	Nos. 1, 15, 20, 21, 22.
	Cloth checker of weaver room.	A cut of cloth.....	Nos. 1, 15, 13, 20, 21, 23, 25, 26.
	Cloth trucker.....	Cuts of cloth.....	Nos. 1, 15, 20, 21, 23, 25.
	Quill man.....	Used filling bobbins.	Nos. 1, 15, 21.
	Overseer weave room.	.....	Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 23, 24, 31, 26, 34.
	Second-hand weave room.	.....	Nos. 1, 2, 15, 13, 20, 21, 22, 23, 25, 26, 31, 34.
	Checker cloth room.	.....	Nos. 1, 15, 13, 20, 21, 23, 25.
	Sewing and rolling machine tender.	.....	Nos. 1, 15, 23, 25.
	Machine inspector.	Inspected cloth...	Nos. 1, 15, 23, 25.
	Brusher tender.....	.....	Nos. 1, 15, 23, 25.
	Folder man.....	Folded cloth.....	Nos. 1, 15, 23, 25.
	Baler.....	Gray cloth.....	Nos. 1, 15, 23, 25.
	Overseer of cloth room.	.....	Nos. 1, 15, 13, 20, 21, 22, 23, 25, 31, 34.
	Second-hand cloth room.	.....	Nos. 1, 15, 13, 20, 21, 22, 25, 34, 31.

PART V.

GENERAL CONTINUATION PART-TIME SCHOOLS AND CLASSES.

Part V.—GENERAL CONTINUATION PART-TIME SCHOOLS AND CLASSES.

1. GENERAL STATEMENT.

The general continuation school aims primarily to meet the needs of young workers over 14 years of age who for any cause may have left the regular school and entered employment. The instruction given these young people, both boys and girls, must be for the purpose of enlarging their civic or vocational intelligence; that is, it must make them more intelligent and independent citizens, primarily, as well as skillful workers.

Few kinds of work with which they may engage are wholly lacking in educational qualities, but in most of them the development is soon exhausted. Then such activity ceases to be educative and the resulting monotony engenders restlessness and leads to constant shifting from job to job, occupation to occupation, place to place, and increases social unrest. For the purpose of raising the young workers to and through these different levels of employment it is highly desirable that they should spend part of the time in school continuing their education at the same time that they are being employed. In changing from these levels they frequently need help in making a suitable choice of a new occupation and in securing such training as will enable them to progress. Industry is not so organized that it can provide this opportunity. The continuation school is the public educational agency provided by the Federal vocational act to perform this service.

The State's obligation to those children who leave the day school for employment is as great as to those who remain within the schools. It is obviously to the interest of the State to encourage, even to require, that each young employee or prospective citizen must be trained for useful, satisfying employment necessary for a self-dependent existence; must be helped to make his experience contribute to his progress; must be encouraged to value his abilities and aptitudes in terms of his opportunities; must be stimulated to use his time in self-improving activities; must be trained in habits of economy and thrift; must be guided to make the most of himself and life.

The establishment of continuation schools is a joint responsibility requiring the complete cooperation of the employer, employee, and

the community. Each is helpless without the other's assistance. The number of children whose needs may be met is great. Their educational status varies according to the age and school attainments required by the laws of the respective States before releasing children from school attendance. It is a well-established fact that any instruction which will reach their level must be exceedingly elementary and intended, first of all, to remove the deficiencies in general education. It follows that the organization of the school must be very flexible in order that the needs of individual pupils be served and their interest maintained.

When a child is released from the regular school class and an employment certificate is issued in accordance with the laws of the State, he should be registered for the continuation class. In this way he never passes out from under the jurisdiction of the school until he arrives at the maximum school age prescribed by the State laws.

On entrance to these classes it is quite necessary that the child should become fully informed in regard to the opportunities which the school offers. It is likewise advisable that personal relations be established as early as possible with the child in his threefold environment—his home, his place of employment, and his school.

Because of the very limited school experience of young workers in textile mills, in all probability the continuation classes would assume the nature of general improvement classes. As such, the instruction would probably parallel to some degree that of the regular school, except that it would be more concrete and relate to the child's experiences whenever possible. It would deal with the fundamentals of education, development of powers of thought and expression, physical training, hygiene, civics, good manners, and right conduct. If the group is migratory, it may be necessary to plan each lesson as a separate unit, with a certain sequence maintained.

(A) TIME DISTRIBUTION AND GENERAL CONTENT.

Inasmuch as the instruction in continuation schools must be given for not less than 144 hours per year, the time might be distributed as follows:

Fifty per cent devoted to regular school subjects and training based on regular school requirements.

Twenty-five per cent devoted to discovery and development of natural interests and abilities.

Twenty-five per cent devoted to civics, hygiene, recreation, and cultural subjects.

(B) ADVANCED SUBJECTS.

Where the advancement of the pupil warrants, continuation classes of the higher grade—clerical work, typewriting, intensive courses in home making, and other subjects of a prevocational nature—could be offered. This group, however, would be extremely small.

A third type of class might be formed in which the instruction would relate to the occupation at which the pupil was employed and enable him to secure advancement or progression in the same.

The amount of strictly vocational work would be a constantly increasing quantity in the two latter groups.

2. TYPES OF INSTRUCTION.

The relative distribution of time allotted to various types of instruction may be apportioned according to the purpose for which it is given.

(A) GENERAL IMPROVEMENT CLASSES.

Civics, hygiene, cultural studies, and recreation, one-fourth.

Discovery of interests and powers, one-fourth.

Training to remove deficiencies in general education, one-half.

(B) PREVOCATIONAL CLASSES.

Civics, hygiene, cultural studies, and recreation, one-fourth.

Information related to shopwork, one-fourth.

Shopwork (industrial, clerical, home making), one-half.

(C) TRADE EXTENSION CLASSES (IN PART).

Civics, hygiene, cultural studies, and recreation, one-fourth.

Shopwork and information related to trade, three-fourths.

3. AIM OF INSTRUCTION.

All instruction to be effective must be as concrete as possible and based upon experiences with which the pupil is familiar. Inasmuch as the educational attainment of the 14 to the 16 year old worker in mill communities is extremely limited, the chief end of this work in those communities must be to improve the general intelligence of the individual child, and the instructional program must recognize his elementary needs and interests.

In prevocational and trade-extension classes shop work may be provided, either in the regular school or on machines provided for by the mill. Shopwork for the girls may be either industrial or clerical or of the home-economics type. The tendency to give training in home making in the lower grades in the mill schools is highly desirable. For the continuation school work the teacher-

age might become the center around which the cooking, sewing, and general home-making activities are taught. The lessons must be exceedingly elementary, simple, and practical, and planned according to the needs and traditions of the community. Girls are found doing the housework while their mothers or fathers, or both, work in the mill; others are released from the mill in time to prepare the noon meal. Most of the housekeeping is done at night. The adult usually buys her own clothes, but makes garments for the children.

Teaching proves effective when a definite occasion becomes the opportunity for presenting a subject. Owing to the migration of families it is advisable to make each lesson a unit in itself whenever possible.

4. SUGGESTED COURSE OF STUDY.

NOTE.—The allotment of time is based upon 4 hours, or 240 minutes, per week for 36 weeks. The minimum requirement of law—144 hours per year—may be distributed in other ways, however.

Subjects.	Time allotment (minutes per week).
English: Reading, composition, oral and written.....	30
Spelling and penmanship (15 minutes each per week, or on alternate weeks) ..	30
Arithmetic.....	30
Citizenship, current events, industrial geography (on alternate weeks).....	30
Physical training: Hygiene, safety first, first aid, 15 minutes; gymnastics, few exercises (games out of regular hours), 5 minutes.....	20
General science (agriculture and gardening in season; nature study).....	20
Shopwork, boys (according to facilities for instruction), or Commercial subjects, typewriting and accounting, or Practical home making—girls—including general housekeeping, cooking, and sewing.....	40
Household mechanics.....	
Assemblies (to be used for general talks, conferences, and group activities)....	

5. SUBJECTS ANALYZED.

(A) ENGLISH.

Aim: To insure ability to read, write, spell, and report orally or in written form. Simple reading, word drills, and sentences.

Subject matter: Story telling, from literature; making of scrap-book readers; reading from papers, magazines, etc., for current history and geography; writing letters—business, friendly, or social—always with a real purpose in view. Keeping records and reports of work done in clubs; memorizing precepts, proverbs, poetry, etc., suitable to occasions.

(B) ARITHMETIC.

Aim: To reason out and perform the calculations necessary for daily life.

Subject matter: The fundamental operations in arithmetic in familiar terms of daily experience. Records of production work; calculation of wages in different departments of the mill. Marketing, household accounts, cost of furniture, food, coal, light; calculation of interest on Liberty bonds, war-savings stamps, insurance; reckoning of purchases from the company's store—savings by cash purchasing—discounts, installment buying, cost of moving. Competitive drills, for swiftness and accuracy.

(C) CITIZENSHIP, CURRENT EVENTS, INDUSTRIAL, GEOGRAPHY, AND OCCUPATIONAL INFORMATION.

Aim: To enable the youth to assume community duties and responsibilities on his own part and for the protection and care of others.

Citizenship: Public safety, including health regulations, sanitation, use of disinfectants, disposal of garbage and waste, fire and police protection, accident prevention, traffic regulations, etc. Local, town, county, and State and National Government as known to the youth through its officers, its buildings, its institutions—the community's need for them and the advantages gained by the individual. How the town promotes its interests; takes care of its sick, its dependents, its defectives, its criminals. Good government clubs, improvement associations, and all types of junior organizations which tend to develop leadership among the youth.

Current events: Affairs political, State and national, as reported from daily papers and magazines should furnish the basis for this work.

Industrial geography: The approach to this study may be made through the cotton industry by discussions covering such topics as the following: Cotton, regions of growth, conditions necessary to growth, value and importance of crops, shipping ports, markets, manufacturing centers, trade routes, process of manufacturing, types of products, etc.

Occupational information: To show what service each person renders the community and at the same time earns a living. Occupations in the mill, studied through visits under the direction of the mill overseers; the processes of manufacture; the duty of the worker; his pay and the safety regulations for each operation. Occupations in the adjoining village—the bank, the electric-light plant, the post office, the stores, the garage, the market, the doctor, the dentist, the lawyer, etc.

(D) PHYSICAL TRAINING.

Hygiene.—**Aim:** To guide in the establishment of wholesome personal habits, and to instruct in safety-first regulations necessary for the industrial worker.

Subject matter: Care of the teeth, eyes, hair, feet, etc.; fresh air, bathing, food, drink, and clothing.

Exercise and gymnastics.—**Aim:** To aid in proper physical development and secure muscular control.

Subject matter: Breathing exercise, posture, gait, etc.; setting-up exercises for quick reaction to directions; marching and drills.

Games and play.—**Aim:** To promote activity in recreation, a spirit of cooperation.

Activities to be directed with leaders: Folk games, team games and sports, competitive games, best appreciated when not scheduled.

(E) GENERAL SCIENCE.

Aim: To cultivate observation and interest in the common phenomena of nature, relating them to their fundamental cause.

Subject matter: Plant and animal life through gardening in season and care of cow or pig; tools and utensils exemplifying simple machines; common laws of nature—light, heat, electricity, physical and chemical properties of matter.

(F) SHOPWORK AND COMMERCIAL STUDIES.

Aim: To enable the youth to become familiar with the use of simple tools, materials, and processes.

Subject matter: The instruction must be determined largely by the equipment and facilities which the school or mill has to offer for this work. For workers in the mill who desire employment in the office—typewriting, timekeeping, wage calculation, etc., may be offered.

(G) PRACTICAL HOME MAKING.

Including house furnishing, the buying for the home, and the keeping of accounts.

Aim: To create a participating interest in the home and pride in its appearance.

Subject matter: Cleaning of the house, laundering of garments, care of stove and kitchen utensils, preparation and cooking of the usual types of foods, the serving of the meal, care of left overs, washing of dishes, towels, and cleaning cloths, disposal of garbage, canning and conservation of garden products, care and feeding of the sick, mending, renovating, and selection and making of simple garments.

(H) HOUSEHOLD MECHANICS.

Aim: To create a participating interest in the home and pride in its appearance.

Subject matter: Setting a window pane, placing a lock or door knob, soldering a kettle, putting up a shelf, a window box, ventilating screen or window board, making a fireless cooker out of a candy pail, simple mending of shoes, putting a washer on a faucet, reading a meter, changing a fuse, painting the woodwork of a room, calibrating a kitchen, papering a room, oiling and regulating a sewing machine, shortening a blind roller, etc.

(I) ASSEMBLIES.

Aim: To provide an occasion for the pupil to voice his interest in determining what the school activities shall be by serving on committees preparing programs, selecting the speakers, and being responsible for the conduct of the meeting.

Subject matter: To be determined by the occasion and opportunity. It might take the form of a dramatic presentation, a demonstration or interesting experiment relating to the regular school subjects, reports on current events, or conferences in small groups on questions raised by the pupils relative to conduct, etc.

6. SUGGESTED METHOD FOR ORGANIZATION.

(An illustration.)

Where a plan is under consideration for the establishment of a general continuation school in connection with a textile mill, the following report from a school already in operation presents a method of procedure.

NOTE.—The hours of instruction here exceed the minimum required by the Federal vocational act.

A. A census—school, industrial and grade—is taken.

- (1) The school census taken by the teacher shows all children in the district available for continuation training.
- (2) The industrial census obtained from the overseer of the mill shows the work which every child does in the mill.
- (3) The grade census by the teacher shows the school attainment of each employed child by grade.

B. A conference between the mill superintendent, school principal, and overseers adjusts the school program to the work of each child employed in the mill.

With the three censuses as a basis, children are paired with reference to their work in the mill; that is, an eight-frame spinner may be paired with an eight-frame spinner, etc.

The children are divided into two shifts—one for morning and the other for afternoon. One of each pair of workers is detailed for morning in the mill and afternoon in the school; the other of the pair reversing the schedule.

Pairing lower and higher grades divides the number of morning and afternoon classes by two and similarly divides the number of teachers necessary for continuation work.

- C. The schedule of work includes regular elementary-school subjects and practical home making. The class work is adapted to the individual need of the pupil. The primary need is reading, consequently word drills, vocabulary lists from texts to be taught, and sentence exercises occupy a prominent place. The arithmetic taught consists of simple drills to promote accuracy and speed in the fundamental operations. Original problems are prepared in calculating wages on piecework in the different parts of the mill, cost of household furnishing, living, moving, exercises in thrift, calculating interest on liberty bonds, war-savings stamps, and value of foods saved by canning clubs. Current history and geography are taught from daily papers and maps and promote intelligent citizenship. Hero stories, epics in prose and verse, memory gems, etc., tend to an appreciation of literature. Housekeeping, sanitation, cooking, sewing, gardening, and conservation of food are taught by practical work at the teacher's cottage. Instruction in gardening is carried on in the usual home garden or on the large school-garden tract. Canning and conservation of foods are taught either in the school kitchen or the community cannery, which sometimes uses the waste steam from the mill.
- D. All part-time pupils work five hours in the mill and three hours in school daily. Fifteen minutes of supervised play follows each 75 minutes of school work by periods. The 75-minute periods are divided into two or three class periods, as necessity or convenience demands. Four days in the week are devoted to grammar-school subjects; one to practical home making. Requests of children who desire additional instruction after school, or "after the whistle blows," are always considered.
- E. Supervised play, singing, folk dancing, story-telling, fill intermissions in book-work. All play is out of doors when the weather permits and many classes are taught under the sky. All self-governed pupils study out of doors or indoors at will. Social gatherings are held at the schoolhouse, at the teacher's cottage, or out of doors, under the direction of the teachers. Refreshments for parties and picnics are prepared at the school kitchen by the children under the supervision of the domestic-science teacher. Materials are furnished by the boys and girls entertaining.
- F. All community work is done by the pupils, teachers, and regular mill workers. Cases of illness, distress, or need are reported by school children for each neighborhood once a day to the grade teacher. When practicable the children themselves minister to the needs reported, the teachers aiding and directing. For example, a case of illness is reported. The child reporting it helps prepare a suitable tray of cookery in the school kitchen. Flowers are cut from the school garden. Children carry tray and flowers to the sick neighbor; bring back the tray and dishes and sterilize the same. Many practical lessons are thus given in the home care of the sick and a neighborly feeling is developed and strengthened.
- G. The highest percentage in regular attendance at this mill school was made by part-time pupils.

APPENDICES.

APPENDIX A.

JUSTIFICATION FOR PROVIDING TEXTILE EDUCATION IN THE SOUTHERN STATES AS SHOWN BY THE GROWTH AND MAGNITUDE OF THE INDUSTRY.

TABLE 1.—*Increase in cotton manufacture in the Southern States during the past 15 years.*

	Northern mills.	Southern mills.
	Per cent.	Per cent.
Increase in number of mills.....	1	69
Increase in number of employees.....	15	86
Increase in value of products.....	75	199
Increase in number of spindles.....	29	311
Increase in number of looms.....	19	163
Increase in cotton consumption in 20 years.....	85	295

TABLE 2.—*Growth of southern cotton-manufacturing industry as shown by increase in the number of spindles.*

Year.	Number of spindles.	
1909.....	1	91
1910.....	6	43
1911.....	11	59
1912.....	11	14
1913.....	12	56
1914.....	12	33
1915.....	13	24
1916.....	13	80
1917.....	13	46
1918.....	14	91
1919.....	14	52

TABLE 3.—*Southern cotton mills showing the magnitude of the industry in 1917-18.*

	Number of mills.	Number of spindles.	Number of looms.	Bales consumed.
Alabama.....	74	1,183,572	20,171	390,644
Arkansas.....	2	14,000	276	7,460
Georgia.....	157	2,469,266	46,751	864,111
Kentucky.....	7	90,964	1,353	20,855
Louisiana.....	8	103,128	2,068	37,736
Mississippi.....	17	164,902	4,144	69,081
Missouri.....	3	31,896	730	26,704
North Carolina.....	274	4,723,004	70,072	1,196,279
South Carolina.....	196	4,931,806	115,636	904,975
Tennessee.....	26	401,012	5,308	131,219
Texas.....	15	141,272	3,612	87,126
Oklahoma.....	1	8,712	64	6,079
Virginia.....	13	596,024	15,048	565,300

APPENDIX B.

Federal funds available for trade, home economics, and industrial education in the southern cotton-manufacturing States.

NOTE.—The Federal law requires that one-third of the appropriation be spent for part-time instruction. All Federal funds must be matched by State or local funds, thus making available for salaries of teachers double the amounts given in the above table. In most of the States the State boards for vocational education allot 20 per cent of the amounts above mentioned for home economics education.

APPENDIX C.

Possibilities for organizing textile classes in the southern cotton-manufacturing States.

State.	Number of cities having cotton mills.	Number of mills.	State.	Number of cities having cotton mills.	Number of mills.
Alabama.....	41	74	North Carolina.....	142	274
Arkansas.....	2	2	Oklahoma.....	1	1
Georgia.....	88	157	South Carolina.....	92	196
Kentucky.....	7	7	Tennessee.....	17	26
Louisiana.....	1	5	Texas.....	13	13
Mississippi.....	15	17	Virginia.....	12	12
Missouri.....	2	3			

APPENDIX D.

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* Emergency war training for conscripted and enlisted men.



